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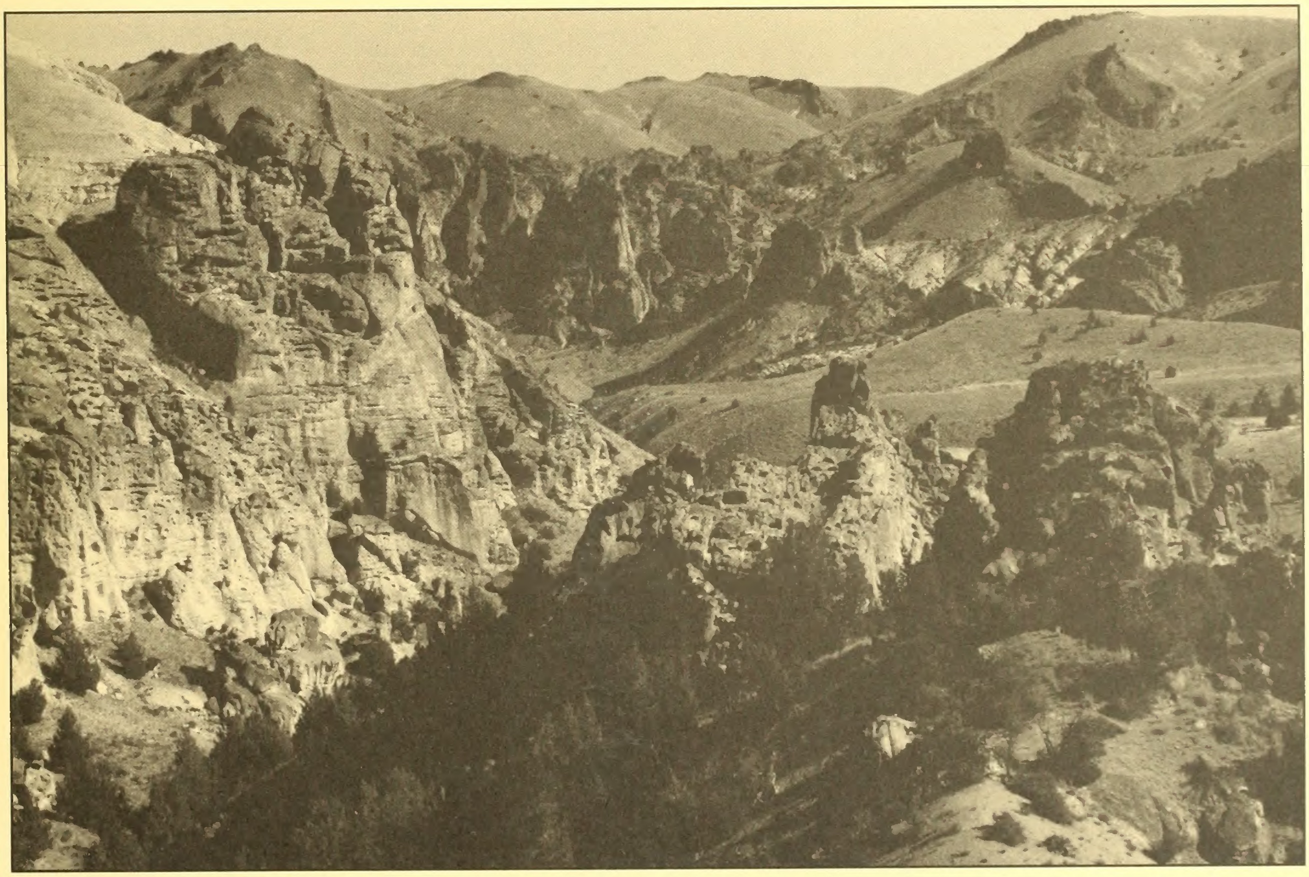
December 1989

Oregon Wilderness

Environmental Impact Statement

Volume II

Includes Appendices for all WSAs beginning with OR-1, OR-5, OR-11, and OR-12



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Appendix to the Wilderness Environmental Impact Statement for Oregon

Devils Garden Lava Bed Wilderness Study Area (OR-1-2)

1. Introduction

General Description of Study Area

The Devils Garden Lava Bed Wilderness Study Area (WSA) is located in Lake County, about 60 miles southeast of Bend, Oregon. The WSA is 8 miles north of the small town of Fort Rock and accessible by county road from Oregon State Highway 31 (see Map 1).

The study area is roughly rectangular in shape, and contains 29,680 acres, including 960 acres of split-estate land (see Map 2). The boundaries are primarily defined on the east by private land and vehicle ways and low standard dirt access roads associated with a powerline right-of-way. On the north, west and south, land ownership boundaries and low standard roads define the WSA boundary. Private lands scattered around the boundary, and forming parts of it, are used for livestock grazing. A low-standard dead-end road extends 2 miles into a well in the Devils Garden, forming a part of the boundary.

Most of the WSA is extremely rugged terrain covered by geologically recent lava flows. The WSA receives its name from an open area of some 3,900 acres in the north-central portion of the WSA where the soil was not covered by the lava flows. This area is known locally as "The Devils Garden". It consists of sagebrush grassland with scattered juniper cover and several large cinder cones. Rough aa lava, very sharp and broken in appearance, overlies most of the northern portion. Smoother-textured, less rugged pahoehoe flows cover the south portion of the WSA.

The aa lava area in the north supports juniper, mountain mahogany, ponderosa pine, varied grasses and abundant shrubs. The southern pahoehoe flow has been burned by wildfire on several occasions within the past 20 years. Juniper and dense brush areas remain in many pockets within the flow and a variety of grasses grow in any available soils.

There are a number of lava tube caves in the WSA, the largest and best known being Derrick Cave, near the northeast corner of the WSA. A number of cinder cones occur in the area; the most interesting is known as the "Little Garden", and is located in the northeast portion of the WSA. It is covered by ponderosa pine and dense stands of native bunchgrasses.

Interrelationships

A 460-acre roadless area in the Deschutes National Forest abuts the WSA on the north. This parcel was not considered suitable for inclusion in any Forest Service Wilderness proposal. A cooperative agreement is currently in force addressing Forest Service/ BLM concerns over fire management plans along the boundary zone where BLM and Forest Service lands meet. Fire in the Devils Garden WSA is of particular concern to the Forest Service, with merchantable timber located immediately north of the WSA.

The WSA is within the Oregon Department of Fish and Wildlife's (ODFW) Paulina Wildlife Unit, which contains 2,045 square miles of deer habitat with 385 square miles of the habitat occurring within the Lakeview District on BLM land. ODFW management goals call for sustaining approximately 18,000 deer within the entire unit with a 14/100 buck to doe ratio. The WSA supports approximately 100 deer in the summer, while approximately 5,000 deer winter on the crucial winter range within the WSA. In recent years there has also been an influx of elk into the area, and although no specific goals have as yet been established, management has begun to focus on the expansion of elk habitat.

The entire WSA has been designated as the Devils Garden Area of Critical Environmental Concern (ACEC) to protect the high natural values relative to vegetation and geologic features in the area. The ACEC designation provides for special management to preserve the natural values and prohibits actions such as mineral leasing and sale of lava and cinders which would degrade or eliminate the primary natural resource. These leasing and sale restrictions apply only to the Federal mineral estate. This special management would continue to apply whether or not the WSA was designated wilderness.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping, and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for analysis in this WSA include:

-impact on wilderness values,
-impact on mineral development, including slab lava removal,
-impact on crucial habitat for mule deer and other wildlife species,
-impact on livestock grazing use levels and management,
-impact on recreation use levels

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- All Wilderness
- Enhanced Wilderness (Proposed Action)
- No Wilderness/No Action

The partial alternative described in the draft environmental impact statement has been dropped due to a conflict between the major objective for the alternative to allow for slab lava removal and the designation of the area as an ACEC with management objectives prohibiting cinder and slab lava removal. Revising the ACEC designation or management was beyond the scope of this EIS. An alternative proposed in public comment to expand the study area boundary to include Cougar Mountain is not addressed as it is beyond the scope of this EIS, which analyzes wilderness and non-wilderness recommendations for areas meeting the wilderness inventory criteria. See Chapter 5 of the Statewide Volume under Formulation of Alternatives for a more thorough discussion of rationale for not analyzing this and similar alternatives.

All Wilderness

The all wilderness alternative would recommend all 29,680 acres of public land in the WSA suitable as wilderness (see Map 2). For purposes of analysis it is assumed the dead-end road to the well in the Devils Garden would remain open. Boundaries would be as described in the general description of the study area.

Energy and Mineral Development Actions

Wilderness designation would close 28,720 acres to all appropriations under the mining and mineral leasing laws. Due to the lack of direct evidence to support exploration or development for geothermal energy, the difficulty of access and the lack of interest in exploration in this area, no energy exploration or development is projected. Exploration and development for minerals would not occur, as current ACEC designation precludes the removal of slab lava and cinders.

A total of 960 acres of split-estate land would remain open to mineral exploration and development. As less than 200 acres within the split-estate contains high potential for slab lava where access is extremely limited, and the present holder of the mineral estate favors wilderness designation of the area, it is unlikely that this limited resource would be exploited.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to support existing wildlife populations in accordance with ODFW management goals identified in the interrelationship section, consistent with BLM's Wilderness Management Policy. Emphasis would continue on protection of crucial deer winter range, range for wintering elk, and wintering area for the northern bald eagle (Federally listed as threatened in Oregon). Habitat management includes coordination with livestock grazing management to ensure sufficient forage for wildlife.

Livestock Management Actions

Livestock use would remain at the current level of 914 AUMs within the six grazing allotments partially or entirely within the WSA. The livestock allocations and seasons of use would remain as identified in Table 4 for the six allotments. Vehicle access for livestock management on 20 miles of ways would be precluded. The 2 miles of road necessary to bring in a pump motor to Devils Garden well, and for subsequent pump maintenance, would remain open during any use period of the 287 AUMs in the Devils Garden allotment. Emergency use of the Devils Garden allotment would occur when drought, fire or other act of nature precludes the permittee from fully utilizing forage on other allotments under license. Historic use was annual until 1983. Use was requested in 1987, but did not occur due to the cost to the permittee of having to install a pump motor. This use would require approximately three trips per grazing use period, which would be on an average of 4 years in any given 10 year period. Well maintenance would require a well drilling truck to be driven into the area approximately once every 10 years in order to maintain well pipe.

Recreation Management Actions

The entire 29,680 acres in the WSA would be closed to motorized vehicle use, closing 20 miles of ways to vehicle-oriented recreation. Travel off of existing ways and roads is precluded due to the extremely rugged terrain in the study area and to off-road-vehicle designation expected to continue in force under the ACEC designation. Visitor use for the WSA as a whole is approximately 2,000 visitor days per year. Vehicle-oriented use occurs in the Devils Garden portion of the WSA and is less than 200 visitor days per year.

Enhanced Wilderness (Proposed Action)

Under the enhanced wilderness alternative 28,160 acres of public land would be recommended as suitable for wilderness (see Map 3). The mineral estate of 960 acres of split-estate land would be acquired from willing owners, through purchase or exchange. The 2-mile dead-end road into the Devils Garden well and 17 miles of ways within the WSA would be closed.

On the east, the boundary would be aligned on private land boundaries, low standard BLM roads and the right-of-way for Bonneville Power Administration (BPA) and Pacific Power & Light (PP&L) power lines. On the northwest, the boundary would follow vehicle ways around the lava flow, which would represent a more clearly defined physical boundary than the current land ownership boundaries. On the west and south, the boundary would be defined by private land and low standard roads and ways.

Lands recommended nonsuitable total 1,520 acres. The primary block of nonsuitable lands lies outside the lava flow in the northwest corner of the WSA. Small parcels lie outside the flow on the southeast and southwest (see Map 3).

Energy and Mineral Development Actions

Wilderness designation would close 28,160 acres to all appropriations under the mining and mineral leasing laws, assuming acquisition of mineral estate on 960 acres of split-estate land. Due to the lack of direct evidence to support exploration or development of low potential metallic minerals or the moderate potential geothermal energy, no mineral or energy actions would be anticipated. Current ACEC restrictions already preclude energy leasing and the sale of slab lava and cinders in the area.

Surface disturbing mineral exploration and development would be allowed under the mining laws pertaining to locatable minerals on the 1,520 acres not suitable for wilderness, although as noted above, such development is not considered probable.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to support existing wildlife populations as described in the all wilderness alternative. Emphasis would remain on protection of crucial winter range. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Livestock Management Actions

Livestock grazing use would continue at existing levels of 914 AUMs. Vehicle use of the 2-mile dead-end-road during use periods to install and maintain the well in Devils Garden would be allowed as described in the all wilderness alternative. Use of vehicles on 17 miles of ways would be precluded. Such use could occur on 3 miles of ways in the nonsuitable portion. Most livestock management uses horseback or other primitive means for checking livestock and removing livestock from the area.

Recreation Management Actions

Within the area recommended suitable as wilderness, 28,160 acres would be closed to motor vehicles, resulting in the closure of 17 miles of vehicle ways and 2 miles of road. The total current visitor use is estimated at less than 2,000 visitor days per year. Vehicle-associated recreation use in the Devils Garden is estimated at less than 200 visitor days per year. Vehicle use is limited by the rugged terrain of the flows and existing vehicle-use designations to existing ways and roads in the WSA.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire 29,680 acres would be open to mineral entry. Exploration and development would be prohibited for leasable or salable minerals (such as geothermal, oil and gas, slab lava and cinders) under ACEC management. Exploration for locatable minerals would not be precluded in the absence of a formal mineral withdrawal associated with ACEC management. However, no such exploration or development is projected due to the fact that only low potential for metallic minerals exists in the area.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife population goals of ODFW, with emphasis on crucial deer winter range. Additional emphasis could also be placed on elk management if herd size continues to increase. ACEC designation on the area would continue, placing emphasis on protection of natural values, including wildlife habitat. A burn-and-seed project to enhance mule deer habitat along the west edge of the lava flow could be completed, directly involving less than 30 acres between the boundary road and the lava flow inside the WSA. Two proposed guzzlers to serve wildlife would be constructed under this alternative.

Livestock Management Actions

Livestock grazing would continue at the 914 AUM current stocking level. Vehicle use would continue on 20 miles of ways and 2 miles of road. The roads and ways are currently used approximately 10 to 20 times per use season. No range developments are proposed.

Recreation Management Actions

Vehicle use would be limited to existing ways and roads under an ACEC management plan. Current recreation use is 200 visitor days or less in the Devils Garden, with approximately 2,000 visitor days of use in the WSA as a whole.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Devils Garden WSA appears to be in a natural condition. The lava flows are extremely rugged and have generally precluded any development. Topography and vegetation limit the visibility of any unnatural features to a very small area. The dense brush stands in the northern end of the WSA in combination with the presence of old-growth ponderosa pine at scattered locations, and the pine-bunchgrass community on the "Little Garden" in the northeast corner particularly emphasize the natural values in the area. On the southern pahoehoe flows, fire has played a key role in demonstrating the ecological interrelationship of natural processes.

Unnatural features influence less than 1 percent of the WSA. There are 20 miles of ways, a 2 mile road to a homestead in the Devils Garden, a homestead site with two old houses, a well and associated corral, and approximately 1,000 acres seeded with crested wheatgrass. Many of the ways are barely locatable on the ground and are not visible from the side due to vegetation. The homestead site in the Devils Garden is a site with potential historical significance and is visible from approximately 40 acres surrounding the site.

Crested wheatgrass seedings in the Devils Garden and on Hogback Butte have regrown with brush and native plants so as to be generally indistinguishable from the native bunchgrass areas to the average visitor. Only 80 acres on the southeast corner of the WSA outside the lava flow has the distinct appearance of a seeding. There are two existing big-game guzzlers and one bird guzzler in the area, which visually affect less than 20 acres in total.

Unnatural features outside the WSA that affect the naturalness of the area consist of three high-voltage transmission lines which lie parallel to and outside the east boundary of the WSA. These lines are noticeable from approximately 1,200 acres of the low terrain in the south end of the WSA, but distance and natural features limit visual impact of the lines.

Fire scars within the WSA are a natural part of the ecosystem and are generally viewed as an indication of a natural cycle.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The study area offers outstanding opportunities for solitude and primitive recreation. An immediate sense of solitude is found anywhere within the rugged terrain of the lava flows. In the north, terrain and dense vegetation provide solitude just a few feet inside the WSA. On the southern pahoehoe flows, highly-broken terrain consisting of collapses, kipukas, tumuli and draws provides a strong sense of isolation.

Within the Devils Garden, the more open sage country retains sufficient relief to offer a sense of isolation. The cinder cones offer additional opportunities for solitude as viewing the expanse of the WSA from these points emphasizes the isolation within the area. The "Little Garden", in the northeast part of the WSA, offers an opportunity to look out over the expanse of the WSA while surrounded by ponderosa pine and native bunch grasses. The aesthetics represent the epitome of solitude.

Outside sights and sounds affecting the WSA's opportunity for solitude are minor and limited to the powerlines that parallel the east boundary of the area.

Opportunities for primitive recreation include cave exploration, hiking, photography, nature study (especially with regard to geology), camping, hunting and general sightseeing. The diversity of the WSA offers sufficient variety to sustain extended stays in the area with a broad spectrum of recreational opportunities. The northern part offers the most challenging hiking terrain in the WSA, as well as caving opportunities. The southern part and Devils Garden are more open and offer better terrain for campsites.

Special Features

The Devils Garden WSA contains numerous geologic features of high interest to the educational and scientific communities, especially regarding aspects of volcanism. Volcanic features of unusual complexity representing diverse form and textures have been used by university classes over the years as a field laboratory of significance to the educational community. Two spatter cones, known as "The Blowouts", are located on the eastern edge of the study area. Several lava tube caves, including the well-known Derrick Cave, and a variety of other volcanic features can also be found. The area has been used several times a year for university field courses.

The study area is in an ecotone between the sagebrush steppe and ponderosa pine forest, and therefore contains an assemblage of plants and animals found in both ecosystems. The Devils Garden Lava Bed also contains kipukas--areas of undisturbed soils and native vegetation in lava fields. The entire WSA is located in crucial deer winter range and lies within wintering range for the northern bald eagle, which is Federally listed as threatened in Oregon.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Devils Garden WSA is located in the Intermountain Sagebrush Province, with a potential natural vegetation of sagebrush-steppe with juniper. Though the majority of the WSA is sagebrush and juniper, the north end of the area contains considerable ponderosa pine and mountain mahogany. Vegetative communities listed in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan and occurring in the WSA are: ponderosa pine/big sagebrush, ponderosa pine/bitterbrush/ Idaho fescue, ponderosa pine/western juniper/big sagebrush, western juniper/big sagebrush/bluebunch wheatgrass, western juniper/bluebunch wheatgrass, western juniper, Idaho fescue, western juniper/big sagebrush/bitterbrush, big sagebrush/Idaho fescue, mountain mahogany and aspen.

The Devils Garden WSA is located within five hours' driving time of four standard metropolitan statistical areas with populations over 100,000: Eugene/Springfield, Salem, Portland, and Medford, Oregon.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data, results of a BLM geologic/geochemical study, and data provided by Engineer's International, Incorporated (EII), a consulting firm under contract with BLM. The data are contained in an EII report titled "Geological Investigation and Mineral Inventory of Devil's Garden, Four Craters, and Squaw Ridge in Lake County, Oregon." The most recent report on the area's mineral potential is contained in U.S. Geological Survey Bulletin 1738-A "Mineral Resources of the Devil's Garden Lava Bed, Squaw Ridge Lava Bed, and Four Craters Lava Bed Wilderness Study Areas, Lake County, Oregon", which also addresses U.S. Bureau of Mines input to the wilderness study process.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty).

Table 3 shows the energy and mineral classification for the WSA. Map 5 shows where energy and mineral resources have moderate or high potential for occurrence in the WSA.

The bulk of the study area is characterized by Quaternary basalt flows and other volcanic features such as spatter cones, lava tubes and cinder cones. The surface rocks of the fringe of the WSA are composed of older (Quaternary to Tertiary) basalt. Silicic volcanic rocks of Quaternary to Tertiary age are present around and within the WSA. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depths of thousands of feet.

Energy Resources

Geothermal energy is the main potential energy resource in the area. Although no specific areas of geothermal potential have been identified in the WSA, the entire WSA is considered moderately favorable for the occurrence of geothermal resources based upon indirect evidence of recent volcanism and above normal heat flow (characteristic of most of southeastern Oregon). As of October 16, 1987, there were no leases for any energy resources.

Mineral Resources

The entire WSA is considered to have low potential for the occurrence of metals. This classification is based upon anomalous values obtained from geochemical samples taken from silicic vent rocks within and around the WSA; epithermal (low-temperature) mineralization is associated with silicic volcanic rocks in other areas.

Portions of the WSA are rated as having moderate (2,500 acres) to high (270 acres) potential for the occurrence of slab lava. Forty acres have high potential for the occurrence of cinders. Slab lava located around the edges of the lava flow is readily accessible, while interior deposits lack good access.

In the past 11 years, slab lava has been taken illegally for commercial purposes from the Devils Garden flow. Limited (0-2) inquiries annually to BLM's Lakeview District concerning purchasing of slab lava demonstrate a limited demand for this decorative stone. Except for the Devils Garden, Squaw Ridge and, to a lesser extent, the Four Craters area (all wilderness study areas), stone of this quality, suitable for building facing, does not appear to be available in the area for hundreds of miles.

Mercury, zinc and silver are strategic and critical minerals having a moderate potential for occurrence throughout the WSA based on indirect evidence, but there are no known strategic and critical mineral deposits within the WSA.

As of October 16, 1987, there were no mining claims within the WSA.

Vegetation

The vegetation in the WSA consists generally of ponderosa pine, western juniper, and big sagebrush/bunchgrass communities. Other trees and shrubs in the WSA include mountain mahogany (particularly in the north), quaking aspen, bitterbrush, wax current, desert-sweet, rabbitbrushes and gland ocean-spray. The shrubs form dense thickets in the kipukas, lava crevices and especially in burned areas. Plants occupy every available soil pocket in the lava material.

Bunchgrasses are abundant in the WSA. Dense stands of bluebunch wheatgrass occur on the drier southern slopes of the cinder cones, with Idaho fescue on the northern slopes. This is an especially prominent feature of the Little Garden area. The Devils Garden area contains big sagebrush, rabbitbrush, native grasses and scattered juniper.

The vegetative communities in the WSA vary from early seral in The Devils Garden to late seral and near-potential natural community conditions in the Little Garden.

Wildlife

The Devils Garden Lava Bed WSA is located entirely within a crucial deer winter range. Most of the herd winters in the lava areas in and around the Devils Garden and moves to the Deschutes National Forest the rest of the year, but some deer are year-round residents. Approximately 5,000 deer use this WSA as all or part of their winter habitat. The area is important for both the excellent thermal cover offered by the lava flows as well as for forage. Forage conditions for wildlife species are variable; average condition is fair.

The WSA also supports an increasing number of elk coming south in winter from the Deschutes National Forest. The elk concentrate mostly in the northern portion of the study area. Other wildlife in the area include bobcat, porcupine, marmot, ground squirrel, chipmunk, bats, gopher snakes, fence lizards and other reptiles. There are occasional reports of black bear and cougar in the area. Bird species include great horned owl, barn owl, prairie falcon, kestrel, raven, loggerhead shrike, mountain bluebird, scrub jay, downy woodpecker, sage sparrow and rock wren. The wide variety of vegetation types and terrain accounts for a tremendous diversity of bird species. The WSA is within the range of the northern bald eagle, which is Federally-listed as threatened in Oregon. The WSA does not represent prime habitat or nesting habitat for the species and sightings are rare in the area.

Cultural Resources

Cultural resources such as the historic settlement site and scattered prehistoric lithic sites are known to occur in the area.

Watershed

There are no perennial streams or springs in the WSA.

Livestock Grazing

Portions of five grazing allotments and all of one allotment are included in the Devils Garden WSA. Table 4 shows existing livestock use in AUMs, and season of use for each allotment. Total livestock use in the WSA is approximately 914 AUMs. The Devils Garden allotment, which lies entirely within the WSA, is authorized for 287 AUMs of use on an emergency basis only. The season of use for emergency allocation of this allotment could extend from April 15 to September 30.

Grazing operators in the WSA currently use the vehicle ways in the Devils Garden for livestock management. This currently entails one trip at the beginning of the temporary use period on the 2-mile road into the Devils Garden by truck to install a pump for the well, and two trips during the use period for fuel hauling. Use of ways in the WSA for livestock management is limited to occasional use of the ways in the Devils Garden allotment. Gathering of livestock is usually accomplished by horseback.

Recreation Use

The principal recreation activities in the WSA are exploration of the unique lava features, hiking, nature study and camping. Derrick Cave is the most-used area for cave exploration and study. An estimated 600 to 1,000 visitor days is devoted to camping in and around Derrick Cave. Camping use is also heavy in the vicinity of the Blowouts and in the border area near the Deschutes National Forest boundary. There are good camping sites on the east side of the WSA from the Deschutes boundary south to Hogback Butte and Derrick Ranch.

Hunting occurs in the Devils Garden, and around the periphery of the WSA. Vehicle-oriented recreation within the WSA is extremely limited due to terrain, and restricted to existing roads and ways by designations in force. Total recreation use in the area is approximately 2,000 visitor days per year. Physical conditions within the rugged lava flows limit the majority of recreation use in the WSA to primitive-type recreation.

Local Personal Income

Livestock use at the current level of 914 AUMs and recreation use totaling 2,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $11,000 for livestock grazing and $24,000 related to recreation use, for an overall total of approximately $35,000. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 29,680 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and wilderness values within the entire 29,680 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features, including significant geologic features, crucial winter deer range, bald eagle habitat and diverse native vegetation would be preserved.

Naturalness

Although most of the WSA is in a natural appearance due to the rugged terrain and lack of human disturbance, the naturalness of the Devils Garden area, in particular, would be enhanced by prohibiting motorized vehicle use. The undisturbed lava flows and unique geologic features would also be protected by this action. Closure of 20 miles of vehicle ways would allow for revegetation of 20 acres, further enhancing the naturalness of the area.

Solitude

Opportunities for solitude provided by the area's size and topography would be enhanced by the elimination of motor vehicle use on 20 miles of ways within the WSA, removing the visual and auditory influence of vehicles from 6,000 acres. With vehicles limited to the boundary roads and to the 2-mile road into Devils Garden (short term use for livestock management), visitors would have a large core area in which to recreate undisturbed by vehicles and associated noise.

Primitive and Unconfined Recreation

Closure of the WSA to motorized recreation use would increase opportunities for primitive and unconfined recreation in the study area by eliminating the visual and auditory influence of vehicles from 6,000 acres. The opportunity to enjoy a more primitive, wild setting would be enhanced.

Special Features

Wilderness designation would legislatively preserve the special geologic features of the area. Vegetation dependent on the existing undeveloped environment would be preserved, as would the crucial deer winter range and northern bald eagle habitat within the WSA.

Conclusion: Wilderness designation of the entire 29,680 acres of the Devils Garden WSA would result in protection of existing wilderness values and enhancement of those values.

Impacts on Mineral and Energy Development

Wilderness designation would close 28,720 acres to all appropriations under the mining and mineral leasing laws. The 960 acres of split estate in the WSA would remain open to mineral and energy exploration.

Energy Development

Exploration for geothermal resources, which have a moderate potential for occurrence based on indirect evidence, would be precluded on 28,720 acres by ACEC restrictions. Exploration could occur on the 960 acres of split-estate lands within the study area. Exploration and development are not postulated on the split-estate land, due to a lack of geologic evidence, poor access and lack of interest in the past.

Conclusion: There would be no impact to energy development.

Mineral Development

The 270 acres with high potential and 2,500 acres with moderate potential for slab lava plus 40 acres with high potential for cinders would be closed to mineral entry. Development of collecting areas for slab lava and cinders is precluded by ACEC designation. There is insufficient direct evidence to warrant exploration or development of minerals on the split-estate parcels in the area. Slab lava from split-estate lands has moderate potential on approximately 200 acres, but is not projected for development due to limited available resource, difficult access and the indicated desire of the present owner for the area to be designated wilderness.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

Vegetative composition as described in the vegetation section of the Affected Environment would not be changed. Ecological status in the area varies from early seral stage in the Devils Garden to late seral stage to near-potential natural community in the "Little Garden" other scattered areas. Vegetation in late seral and potential natural community stages would not be expected to change, while early seral communities would be expected to follow natural ecological succession to reach potential natural community.

The 20 miles of vehicle ways closed would revegetate the affected 20 acres within 2 to 5 years.

Conclusion: Little or no change would occur to vegetation over much of the area. The 20 miles of ways would revegetate.

Impacts on Wildlife

Wildlife habitat would be preserved in native condition, providing crucial winter range for approximately 5,000 wintering deer. ODFW management goals would be met. No impacts to wintering bald eagles is anticipated. Two wildlife guzzlers for deer would be precluded because existing habitat conditions meet the current herd needs, and these guzzlers would provide enhancement only. One bird guzzler would also be precluded.

Closure of 20 miles of ways to motorized vehicles would reduce disturbance to wildlife by vehicles, thereby reducing the impact to the wintering deer and elk herds.

Conclusion: Existing habitat for deer, elk, northern bald eagle, and other nongame species would be maintained.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 914 AUMs, 287 of which are allocated only on an emergency basis. Vehicle access for livestock management would be precluded on 20 miles of ways under wilderness designation. This would result in some inconvenience to livestock operators. Use of vehicles to service the Devils Garden well would occur three times during each emergency allocation period on 2 miles of access road which would remain open.

Conclusion: Livestock use would remain at the existing level of 914 AUMs. Vehicle use on 20 miles of ways would be precluded with minor inconvenience to operators.

Impacts on Recreation Use

Wilderness designation would preclude recreation vehicle access on 20 miles of ways within the WSA. Increases in primitive use would be expected to replace vehicle-oriented use of the area. The present total visitor use of approximately 2,000 visitor days per year would be expected to increase by 1 percent, or 20 visitor days, based on Portland State University projections for increased populations in the region.

Conclusion: Increase of 20 visitor days per year due to population growth. Recreation use would change from vehicle-oriented to primitive types of use.

Impacts on Local Personal Income

Livestock grazing would remain at 914 AUMs and recreation use is expected to increase by 20 visitor days per year. Table 5 shows the effects on local personal income generated from these activities. The total effect would be a net increase of $240 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by $240.

Enhanced Wilderness (Proposed Action)

Recommended for wilderness: 28,160 acres (assuming acquisition of 960 acres of split-estate lands)
Recommended nonsuitable for wilderness: 1,520 acres

Impacts on Wilderness Values

The enhanced wilderness alternative would add 28,160 acres to the NWPS.

The 960 acres of mineral estate would be acquired. Wilderness values of naturalness, solitude, primitive and unconfined recreation and special features would be preserved, and acquisition of mineral estate would enhance the ability to preserve wilderness values. Closure of 17 miles of ways and 2 miles of road would allow recovery of vegetation.

In the nonsuitable portion, 3 miles of way on the northwest corner of the WSA would remain open to vehicles. The 1,520 acres nonsuitable for wilderness show little potential for actions which would impact wilderness values.

Naturalness

Naturalness of the 28,160 acres would be enhanced under this alternative. A seeded parcel of approximately 80 acres on the southeast corner of the WSA would not be included in the wilderness, thereby removing this unnatural feature. Closure of 17 miles of ways would allow for the revegetation of 17 acres in 2 to 5 years. The 2 miles of road into Devils Garden well would be used by vehicles 3 times each period of emergency allocation; its revegetation would be expected within 5 to 10 years. Naturalness of the area would be enhanced by these closures.

Three miles of way in the nonsuitable portion would not revegetate. No actions affecting naturalness are projected on nonsuitable lands.

Solitude

The effect on solitude would be similar to the all wilderness alternative with the additional enhancement of opportunities for solitude resulting from the proposed vehicle closures and acquisitions. Closure of 17 miles of ways would eliminate the visual and auditory effects of recreation traffic from 5,000 acres resulting in the enhancement of the primitive recreation experience in a more wild, natural setting. Continued use of the road into the Devils Garden well during periods of emergency grazing of livestock or well maintenance would cause short-term impacts to solitude along this 2-mile segment, affecting approximately 500 acres.

Minor intrusion on solitude over 500 acres would occur as a result of limited vehicle use on the 3 miles of way that would remain open in the nonsuitable portion. Primary activity in this area is limited to approximately two weeks per year during hunting season for mule deer.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be preserved and enhanced within the 28,160 acres recommended suitable for wilderness by the closure of 17 miles of ways and 2 miles of access road with the exception of limited, permit only, access. The removal of vehicle presence and associated noise would benefit aesthetic values on 5,500 acres.

Within the 1,520 acres recommended nonsuitable, opportunities for primitive and unconfined recreation would continue to be affected to a minor degree by continued vehicle presence on 3 miles of way in the northwest corner of the WSA. Use of this section of access would generally be limited to hunting season use over a relatively short period of time.

Special Features

The enhanced wilderness alternative would offer legislative protection to the special geologic features of the lava flows, including slab lava and cinder deposits. Slab lava collection would be prohibited on 960 acres of acquired mineral estate which contains approximately 200 acres with slab lava suitable for collection. Crucial deer winter range and winter habitat for elk and bald eagles would be preserved in a natural condition. Kipukas and other areas of undisturbed soils and vegetation would also be preserved under this alternative.

Nonsuitable lands do not contain substantive elements of special features.

Conclusion: Wilderness designation of 28,160 acres, including acquisition of mineral estate on 960 acres, would protect and enhance existing wilderness values. Minor adverse impacts to solitude would result from continued vehicle access within the 1,520 recommended nonsuitable.

Impacts on Mineral and Energy Development

This alternative would close 28,160 acres to all appropriations under the mining and mineral leasing laws, including the 960 acres of split-estate lands. The 1,520 acres recommended nonsuitable would be open to mineral entry, with ACEC constraints on discretionary minerals actions.

Energy Development

Exploration for geothermal resources, which have a moderate potential for occurrence based upon indirect evidence, would be unlikely on 28,160 acres. Exploration and development are not postulated in the WSA due to a lack of direct evidence, poor access and a lack of past interest to justify a major exploration/development program and due to ACEC restrictions on leasing of the Federal mineral estate.

The 1,520 acres recommended nonsuitable would remain closed to energy exploration and development under the ACEC restrictions on leasing.

Conclusion: No impact to energy development is expected.

Mineral Development

The 270 acres with high potential and 2,500 acres with moderate potential for slab lava plus 40 acres with high potential for cinders would be closed to mineral development under either wilderness protection or ACEC management limitations on discretionary minerals actions. An additional 200 acres with moderate potential for slab lava would be withdrawn if 960 acres of mineral estate is acquired. However, development is not projected due to limited resource and poor access.

Conclusion: The enhanced wilderness action would have no substantial impact upon mineral development.

Impacts on Vegetation

Natural vegetative communities would be preserved on 28,160 acres. Closure of 17 miles of ways would allow revegetation of 17 acres within 2 to 5 growing seasons. Closure of the 2-mile road to all but necessary trips for servicing the Devils Garden well during emergency allocation of livestock forage would allow for its revegetation in 5 to 10 years.

Due to the limited opportunities for modifying the vegetation on the 1,520 acres recommended nonsuitable, there is little potential for vegetative change.

Conclusion: Little vegetative change would result under this alternative. The 17 miles of ways and 2 miles of road would revegetate.

Impacts on Wildlife

The enhanced wilderness alternative would continue to provide crucial winter range for approximately 5,000 deer. Adequate wildlife forage would be ensured in the preparation of livestock allotment management plan goals. Management would meet or exceed the need for habitat to support ODFW goals. Closure of 17 miles of ways and the 2 miles of road into the Devils Garden would prevent disturbance of wintering animals by motorized vehicles. Wildlife projects (3 guzzlers and 30 acres of seeding) to enhance existing habitat would not be allowed within the area.

The area recommended nonsuitable under this alternative would not be expected to change in its productivity as wildlife habitat.

Conclusion: Crucial deer winter range and other wildlife habitat would be preserved throughout the WSA and enhanced by the closure of the ways and 2 miles of road.

Impacts on Livestock Grazing

Livestock grazing would remain at the current use level of 914 AUMs under the enhanced wilderness alternative. Vehicle use three times per allocation on the 2-mile road into the Devils Garden well would occur during emergency use of the allocated 287 AUMs. Vehicle use for routine livestock management would not be allowed on 17 miles of vehicle ways or the 2-mile road, resulting in some inconvenience to livestock operators using the Devils Garden allotment.

Conclusion: Livestock use levels would remain at 914 AUMs. Livestock management would require minimum use of vehicles to service the Devils Garden well. A slight inconvenience to operators using the Devils Garden allotment could result.

Impacts on Recreation Use

This alternative would close 28,160 acres to vehicle-oriented recreation, including the closure of 17 miles of vehicle ways and 2 miles of road. Elimination of vehicle access to the Devils Garden would result in a minor decrease in vehicle oriented recreation activity. However, the present 200 visitor days in this portion of the area would likely be balanced or increased due to primitive recreation opportunities under wilderness designation. Total visitor use levels of around 2,000 visitor days per year would continue for the foreseeable future. Minor increases of 20 visitor days per year would accrue due to population increases in the region. Hunting access would still be available around the northwest edge of the lava flow, therefore recreation activities in the nonsuitable portions of the WSA would not be expected to change.

Conclusion: Minor increase of 20 visitor days per year is expected; with a change from non-primitive to primitive types of use.

Impacts on Local Personal Income

Livestock grazing would remain at 914 AUMs. Recreation use is expected to increase by 20 visitor days per year due to population growth. The total effect on local personal income would be a net increase of $240 per year, as shown in Table 5.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by $240.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 29,680 acres

Impacts on Wilderness Values

Under the no wilderness alternative, the entire 29,680 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and the area's special features, including unique geologic features and crucial wildlife winter range, would be subject to the effects of actions allowable under ACEC management. The management of the area as an ACEC would require special review procedures including public involvement. Management objectives may, however, include a full range of multiple use objectives to include consumptive uses.

Naturalness

Natural values in the entire WSA would be protected to a considerable degree by the ACEC management goals, with required review of management change through public participation. Vehicle use would be limited to existing roads, ways and jeep trails, providing some degree of protection to natural values and appearance of the area. The proposed burn-and-seed project on the west side of the WSA could alter vegetation type on 30 acres between the boundary road and the lava flow and present extremely limited visual impacts as the location would be isolated from view.

Solitude

Solitude would continue to be affected by the use of 20 miles of vehicle ways and 2 miles of access road into the Devils Garden well. Recreational vehicle use and livestock maintenance activities would have repeated short-term visual and auditory impacts on solitude on the periphery of the lava flow and within Devils Garden, affecting approximately 6,000 acres within the WSA. Solitude opportunities in the majority of the lava flow areas would remain.

Primitive and Unconfined Recreation

Vehicle use would continue to be limited to existing roads and ways under ACEC management. Such travel would have repeated short-term impacts to the quality of primitive recreation when vehicles and their associated noise disturbance are in the area.

Special Features

ACEC management would protect the geologic resource from lease or sale activities. The crucial deer winter range would also be protected under ACEC management and habitat enhancement projects could be completed. A burn-and-seed project would alter native vegetation on 30 acres within the WSA.

Conclusion: Wilderness values would be directly affected on 30 acres.

Impacts on Energy and Mineral Development

The entire WSA would be open to mineral entry.

Energy Development

Exploration and development for energy resources would be allowed within the WSA. Lack of direct evidence to suggest energy resources are available, poor access and a lack of past interest indicate that extensive exploration or development would not occur.

Conclusion: There would be no impact on energy development.

Mineral Development

Slab lava collection and development for cinders are not allowed under ACEC guidelines. Geologic evidence obtained does not indicate any potential for development of locatable minerals in the area. Anomalous metallic values from silicic vent areas near the margin of the area do not support a potential for development of minerals in the WSA.

Conclusion: No impact to minerals development is expected.

Impacts on Vegetation

Vegetation would not be affected on the majority of the lava flow in the WSA due to limited accessibility. Emergency grazing use in the Devils Garden allotment would continue, with no substantial change from existing conditions. Completion of a burn-and-seed project on the west side of the WSA would alter vegetation on 30 acres.

Conclusion: Little vegetation change would occur, with only 30 acres converted by burn-and-seed.

Impacts on Wildlife

Proposed burn-and-seed and 3 guzzler projects could be developed to enhance wildlife habitat with slight forage increases and improvement in water availability. The proposed burn-and-seed is located primarily outside the WSA with approximately 30 acres inside the area between the boundary road and the lava flow. Existing livestock water facilities could be used to enhance habitat for elk as well as other game and nongame species in the Devils Garden. Human activities associated with the use of 20 miles of vehicle ways and 2 miles of road would continue disturbance of wintering deer in crucial winter range, as well as year-round disturbance of game and nongame species in the area.

Conclusion: Wildlife populations of game and nongame species would sustain minor levels of disturbance due to human activity associated with vehicle use. Wildlife habitat would be enhanced by providing a minor increase in available forage and watering facilities.

Impacts on Livestock Grazing

Vehicle use for livestock management and facility inspection/maintenance would continue on 20 miles of ways and 2 miles of dead-end road. Present livestock grazing levels would continue at 914 AUMs, including the 287 AUMs available in the Devils Garden allotment on an emergency basis.

Conclusion: There would be no impact to livestock grazing.

Impacts on Recreation Use

Motorized recreation could continue on the existing 20 miles of ways and 2 miles of dead end road into the Devils Garden. Primitive recreation opportunities would be reduced in quality by the presence of vehicles, especially in the Devils Garden. Overall recreation use would be expected to remain at approximately 2,000 visitor days per year with limited increases of 20 visitor days per year due to population increases in the region.

Conclusion: The recreation use level of 2,000 visits per year would not be affected. A very minor increase of 20 visitor days per year would occur with population growth in the region.

Impacts on Local Personal Income

Livestock grazing would remain at 914 AUMs, while recreation use would increase by 20 visitor days due to population growth. The total effect on local personal income would be $240. Table 5 shows the effects on local personal income generated from activities in the WSA.

Conclusion: Annual local personal income generated from resource outputs would increase by $240.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (enhanced wilderness), closure of 2 miles of road and 17 miles of ways would create a slight inconvenience to the livestock grazing operator in the Devils Garden allotment, but no change in use levels.

Minor disturbance to solitude would continue to occur on the area recommended nonsuitable during hunting season, but no change in conditions of the land are projected.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, existing short-term uses would continue, with some minor inconveniences to livestock operators from the exclusion of vehicles for day-to-day inspection activities. The long-term productivity of the wilderness values would be preserved on 28,160 acres.

On 1,520 acres recommended nonsuitable, short-term use for grazing and hunting would lead to minor decline in solitude and natural values from other uses over time.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource on 28,160 acres designated as wilderness. Little potential for change exists on 1,520 acres recommended nonsuitable which would cause irreversible or irretrievable loss of resources due to the ACEC management constraints and characteristics of the lands identified nonsuitable for wilderness.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area is capable of being managed to preserve its wilderness characteristics. Manageability would be enhanced by acquisition of the mineral estate of 960 acres and closure of vehicle access to the Devils Garden. Retaining the northwest boundary on an existing way outside the lava flow would enhance management by providing access around the boundary for patrols to enforce wilderness management objectives, and the boundary would be more clearly identified to the public.

Rationale for Selection of the Proposed Action

The enhanced alternative is the proposed action because the benefits of preserving the area's wilderness values, including the unique lava features, wildlife habitat for crucial winter range, and outstanding opportunities for unique primitive recreation opportunities, would outweigh the benefits of continued vehicle use on the 17 miles of ways and 2 miles of road. Although ACEC designation offers administrative recognition of the special values in the area, it does not afford the permanency of legislative designation and protection offered by Congressional designation of the area as wilderness.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: There is no documentation of demand for slab lava.

Response: The Lakeview District has on file documentation of trespass in the illegal removal of slab lava from the Devils Garden flow and records of telephone requests regarding the availability of slab lava from the district's lava beds prior to the district's decision not to allow removal of this resource. These files are available for public perusal. Records of telephone inquiries since 1978 do not exist because the WSA has been under Interim Management, and slab lava removal has been prohibited. Reference to demand has been added to the Mineral Resources section of the Affected Environment.

Comment: The wildlife analysis is inadequate (great horned owls, barn owls, bats, and cougar not mentioned in text).

Response: Information has been added as appropriate in the Wildlife section under Affected Environment.

Comment: The analysis does not address the expansion of agricultural areas outside of the lava flows and how this expansion affects crucial deer winter range within the WSAs.

Response: Impacts are related in the document to foreseeable conditions under the proposed action and alternatives. Notation has been added in the wildlife habitat sections to denote that habitat enhancement projects are not allowable under present conditions. This is specifically intended to recognize that changes in outside areas could occur in the future that might necessitate development of habitat inside the wilderness area at some time in the more distant future if significant habitat is lost to the deer herd.

Comment: The ecological value of undisturbed soils is not mentioned.

Response: This is addressed in the Special Features section under Affected Environment.

Comment: Archeological sites are not mentioned.

Response: Cultural resources are known to exist in the WSA as stated in the affected environment section, but due to the potential for disturbance of sites, their location is not specifically acknowledged.

Table 1. Summary of Proposed Management Under Each Alternative, Devils Garden Lava Bed WSA (OR-1-2)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	29,680	28,160	0
Acres Closed to ORVs by Wilderness Designation[1]	29,680	28,160	0
Miles of Roads Closed	0	2	0
Miles of Ways Closed	20	17	0
Acres of Mineral Estate Acquired[2]	0	960	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	28,720	27,200	0
Wildlife Projects Developed: Guzzlers (number)	0	0	3
Vegetative Manipulation for Wildlife: Brush Control with Seeding (acres)	0	0	30

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[1] Except for 2 miles of road and 20 miles of ways in the WSA, most of the acreage shown is already closed to cross-country vehicle use through a "limited" ORV designation.

[2] Upon acquisition of mineral estate, these lands would be withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Devils Garden Lava Bed WSA (OR-1-2)

Resource or Activity	All Wilderness	Enhanced Wilderness (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 29,680 acres would protect and enhance wilderness values.	Wilderness designation of 28,160 acres including 960 acres of acquired mineral estate and ACEC designation on remaining acreage would enhance wilderness values. Minor solitude impairment on 1,520 acres nonsuitable.	ACEC designation would preclude most impairing management actions. Minor solitude impairment from continued vehicle access.
Energy and Mineral	No impact to development since none is projected.	No impact to development, since none is projected.	No impact to development, since none is projected.
Vegetation	20 miles of way would revegetate. No change in ecological status.	17 miles of way and 2 miles of road would revegetate. No change to ecological status.	No change in ecological status. 20 miles of way would not revegetate.
Wildlife	Habitat and populations maintained throughout the area. Crucial deer winter range enhanced.	Habitat and populations maintained on 28,160 acres with enhancement of deer winter range.	30-acre forage improvement. Vehicle access would continue in habitat with minor impairment of habitat.
Livestock Grazing	Use remains at 914 AUMs. Minor constraints on management practices due to closure of 20 miles of ways.	Use remains at 914 AUMs. Minor constraints on management practices due to closure of 17 miles of ways.	Use remains at 914 AUMs. No impacts.
Recreation Use	Change to primitive recreation use. Minor increase of 20 visitor days per year.	Change to primitive recreation use. Minor increase of 20 visitor days per year.	No change in types of recreation use. Minor increase of 20 visitor days per year.
Local Personal Income	Annual local personal income generated from resource outputs would increase by approximately $240.	Annual local personal income generated from resource outputs would increase by approximately $240.	Annual local personal income generated from resource outputs would increase by approximately $240.

Table 3. Classification of Energy and Mineral Potential, Devils Garden Lava Bed WSA (OR-1-2)

Commodity	Area	Level of Potential	Level of Certainty
Metals (gold, silver, zinc and mercury)	Entire WSA	L	B
Geothermal	Entire WSA	M	B
Uranium/thorium	Entire WSA	O	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	O	C
Bentonite	Entire WSA	O	B
Diatomite	Entire WSA	L	B
Zeolites	Portion of WSA	L	B
	Rest of WSA	O	B
Perlite	Portion of WSA	L	B
	Rest of WSA	O	B
Slab Lava	See Map 4	H	D
	See Map 4	M	D
	Rest of WSA	L	C
Cinders	See Map 4	H	D
	Rest of WSA	O	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

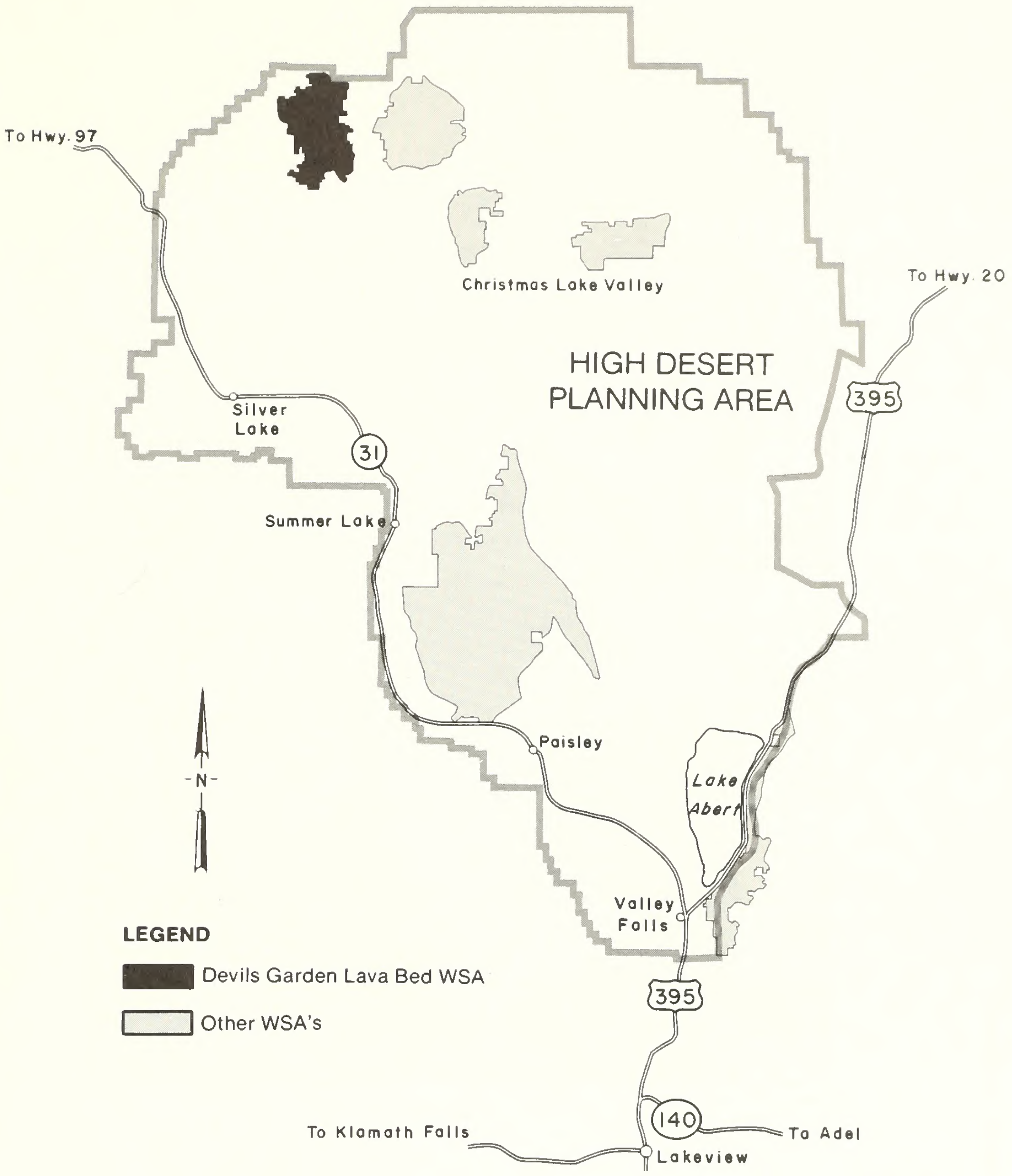
Table 4. Existing Livestock Use, Devils Garden Lava Bed WSA (OR-1-2)

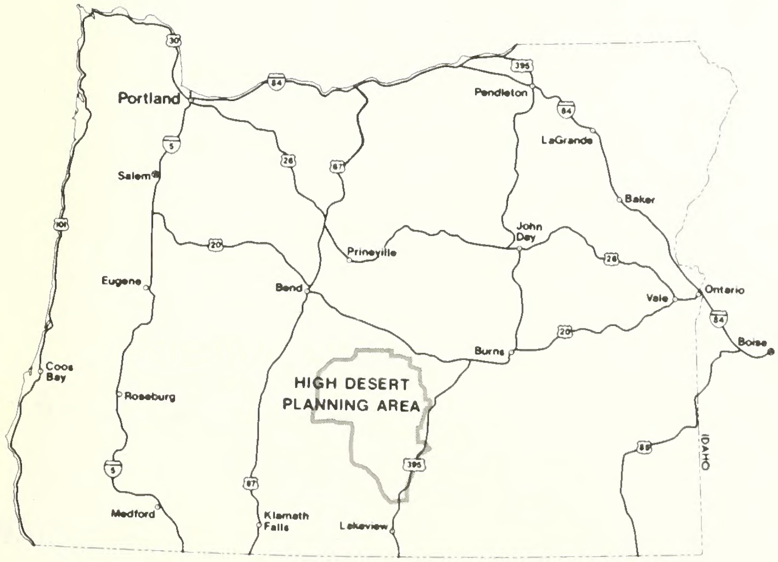
Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allotment in WSA	Current Actual Use in WSA (AUMs)
Fremont(No. 900)	1,970	4/1-9/30	2.6	84
Fremont(No. 905	805	4/1-10/31	5.0	82
Webster Field (No. 906)	112	5/1-11/15	33.1	54
Cougar Mountain (No. 908)	616	4/1-2/15	4.9	76
Hogback Butte (No. 910)	680	4/15-12/15	30.2	331
Devils Garden (No. 907)[1]	0	4/15-9/30	100.0	287
Totals	4,183			914

[1] Temporary non-renewable allotment.

Table 5. Effects of Alternatives on Local Personal Income, Devils Garden Lava Bed WSA (OR-1-2) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	No change	No change
Recreation Use	RVD	+20	+20	+20
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	0	0	0
Recreation Use	$	+240	+240	+240
Total	$	+240	+240	+240





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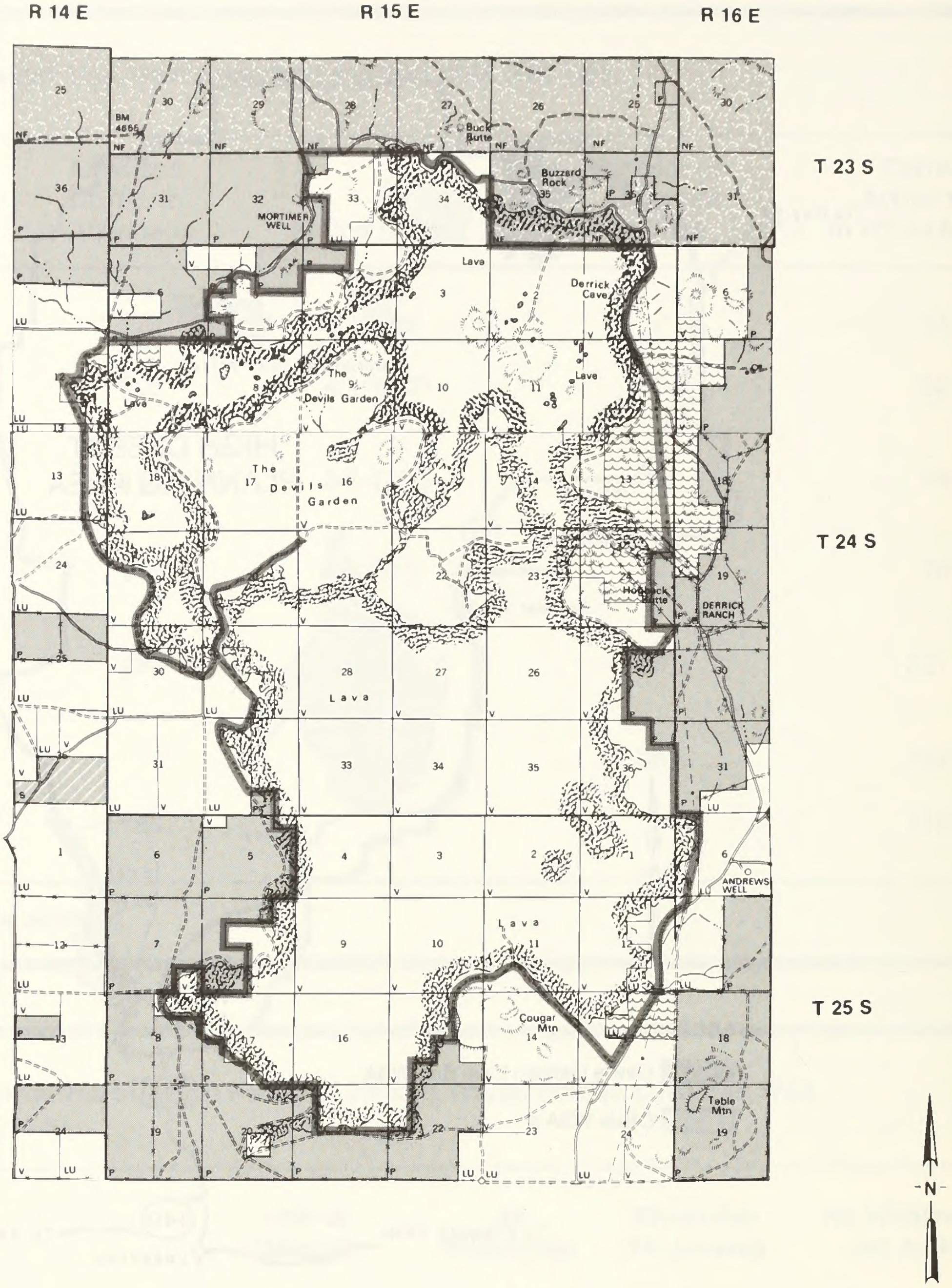
Lakeview District

Devils Garden Lava Bed WSA
OR-1-2

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

━ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

■ Private

▩ U.S. Forest Service

▤ BLM Surface State or Private Subsurface (Split Estate)

▦ Edge of Lava

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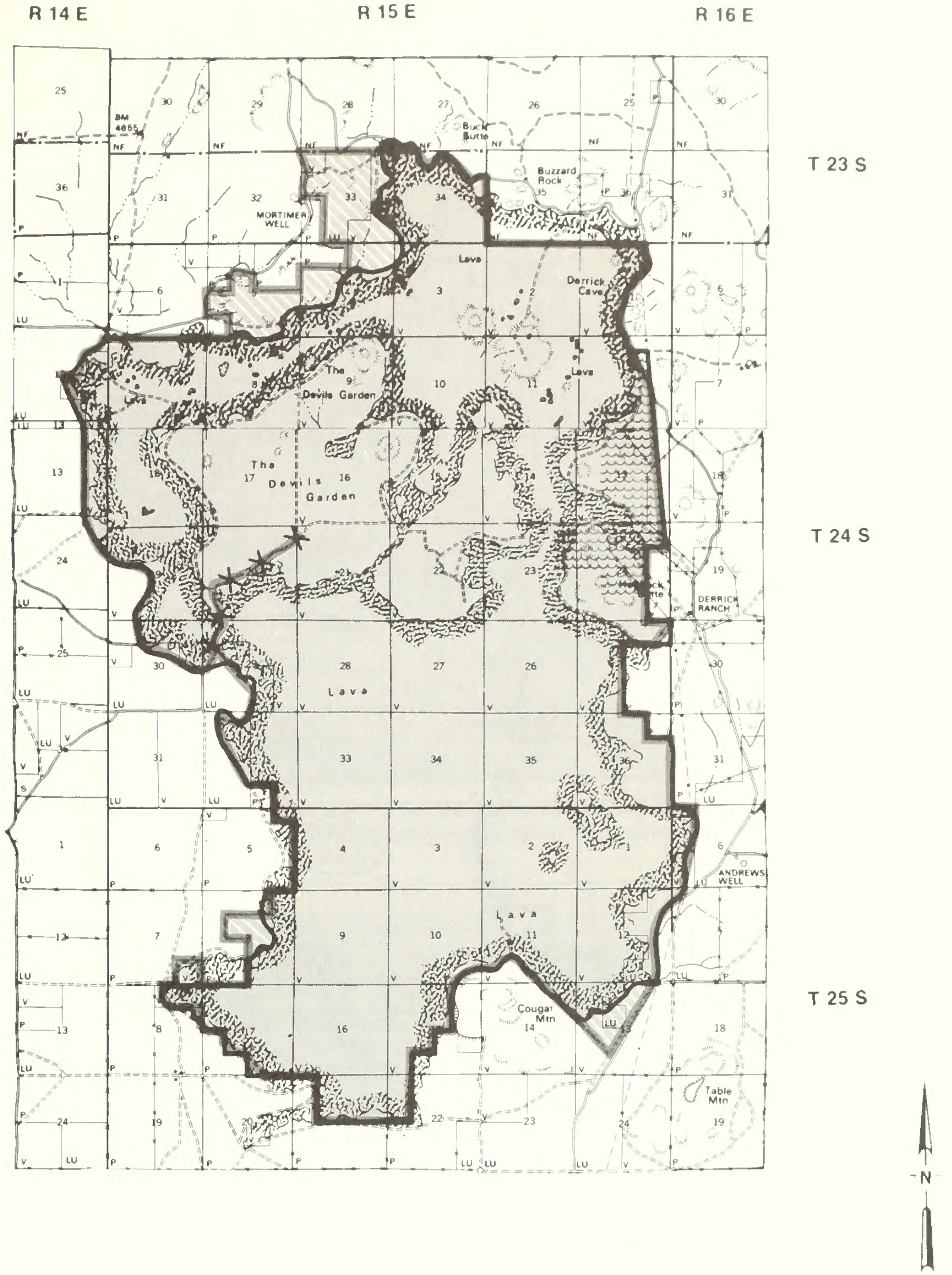
Lakeview District

Devil's Garden Lava Bed WSA
OR-1-2

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▒ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

X—X Recommended Road Closure

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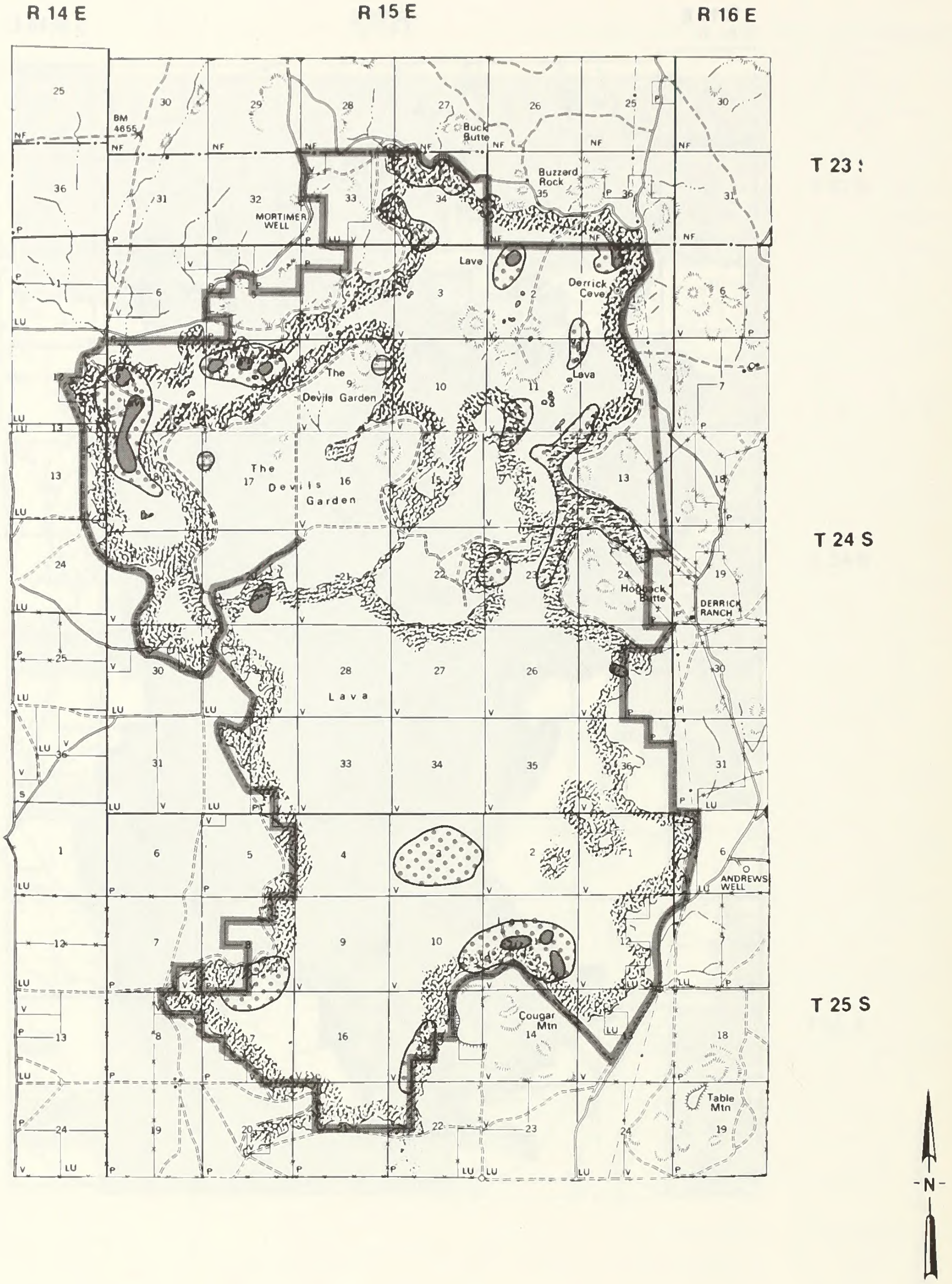
Devil's Garden Lava Bed WSA
OR-1-2

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



■ **High Potential (HD) for Slab Lava**

░ **Moderate Potential (MD) for Slab Lava**

▤ **High Potential (HD) for Cinders**

**Entire WSA:
Moderate Potential
(MB) for Geothermal Resources**

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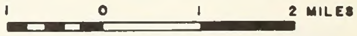
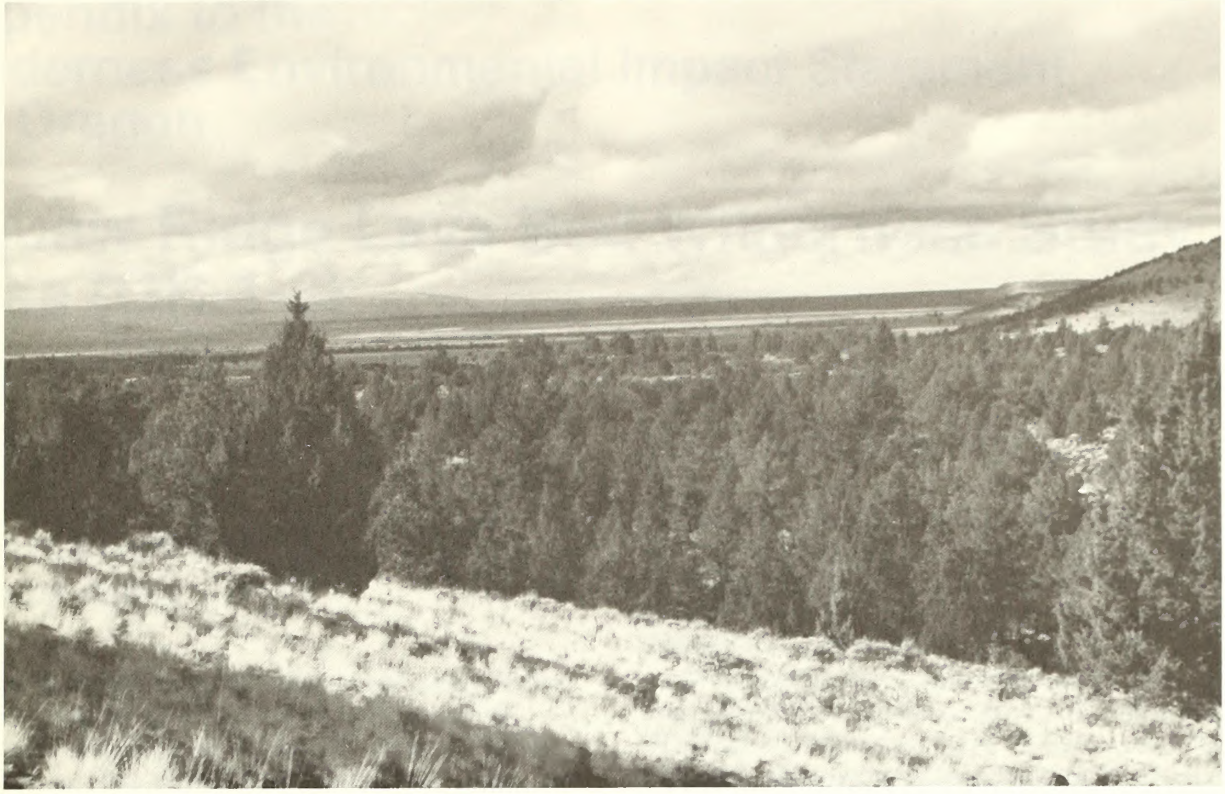
Devil's Garden Lava Bed WSA
OR-1-2

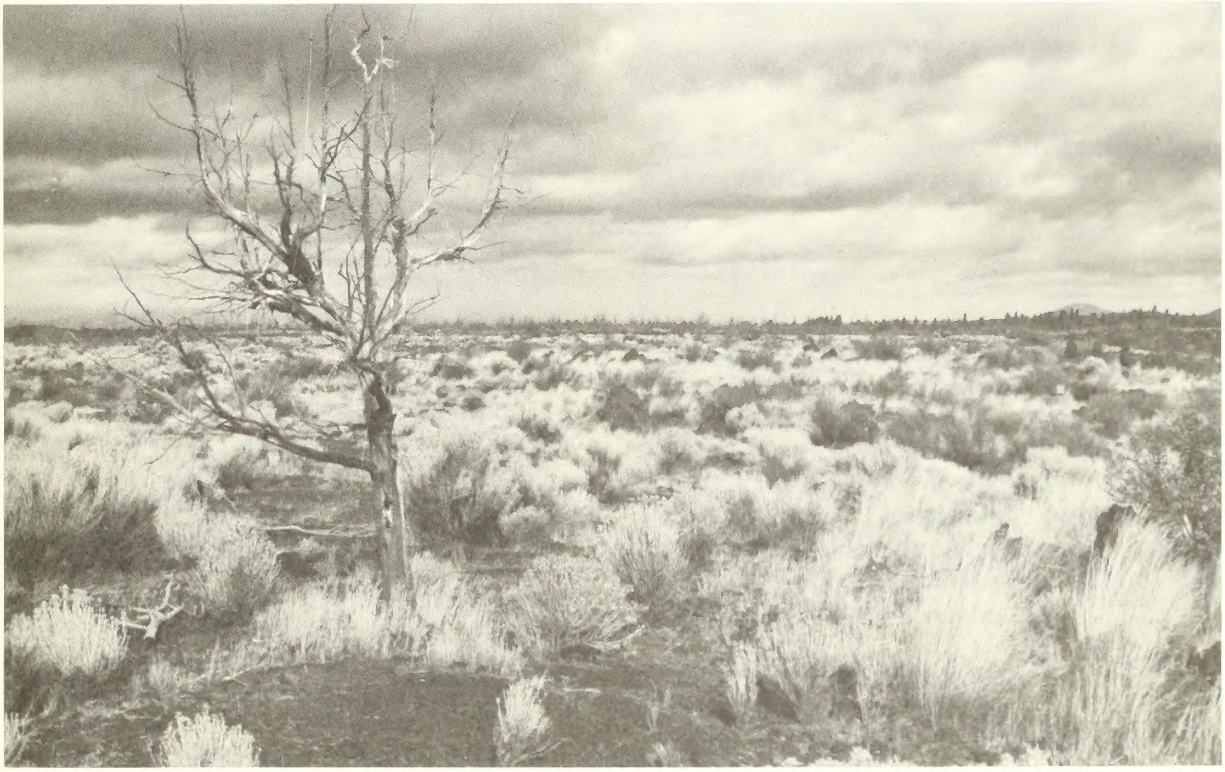
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES



MAP 4



Devils Garden Lava Bed WSA, OR-1-2. Looking west into the central portion of the WSA from the northeast corner. Within the area recommended suitable under the enhanced (proposed action) alternative. Typical of the juniper vegetation in the northeast part of the WSA. October 1981.



Devils Garden LavaBed WSA, OR-1-2. Looking northwest across the southeast corner of the WSA near Cougar Mountain. Within the area recommended suitable under the enhanced (proposed action) alternative. Shows the open scape and pahoehoe lava flow near the WSA boundary. October 1981.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Squaw Ridge Lava Bed Wilderness Study Area (OR-1-3)

1. Introduction

General Description of Study Area

The Squaw Ridge Lava Bed Wilderness Study Area is approximately 80 miles southeast of Bend and 26 miles from State Highway 31 in Lake County, Oregon (see Map 1). The WSA is approximately 12 miles northeast of the town of Fort Rock.

The study area contains 28,340 acres of public land and a 320-acre State inholding near the eastern edge of the WSA. Lands surrounding the WSA are mainly public with some private lands along the western edge (see Map 2).

The WSA, roughly circular in shape, is dominated by an extremely rugged basalt flow which issued from what is now called Lava Butte, and forms a flattened cone covering approximately two-thirds of the study area. Elevation ranges from 4,300 feet to 5,585 feet at the summit of Lava Butte near the center of the WSA. Vegetation consists primarily of western juniper/sagebrush/bunchgrass communities on the lava flow and western juniper/big sagebrush-rabbitbrush communities surrounding the flow. Mountain mahogany, aspen, and ponderosa pine also occur at various locations within the lava flow. The boundaries are described by high standard gravel roads on the south, private land and 1.5 miles of low standard dirt road on the west, low standard dirt road on the north and low and high standard dirt roads on the east. Small portions of the east and north boundaries are formed along private land (see Map 2).

Interrelationships

Squaw Ridge WSA is located approximately 4 miles east of the Devils Garden WSA. It is located within the Oregon Department of Fish and Wildlife's (ODFW) 2,045-square-mile Paulina Wildlife Management Unit. The WSA is entirely within the crucial deer winter range for the Devils Garden deer herd, providing winter habitat for approximately 10,000 mule deer. ODFW goals include a ratio of 15 bucks per 100 does within the Management Unit. Elk populations have been moving into the area in recent years but no formal management plan for elk has been developed at present. The goal for nongame wildlife is to maintain populations of naturally occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources selected as issues specifically for analysis in the Squaw Ridge WSA include:

- impacts on wilderness values,
- impacts on livestock grazing,
- impacts on slab lava and cinder removal,
- impacts on vegetation,
- impacts on crucial mule deer winter range and elk habitat, and
- impacts on recreation use levels.

The following topics were also considered, but not analyzed for this WSA because the environmental significance or concern was not major to the decision process:

- impacts on cave resources and cave access. There are limited cave resources in the WSA.
- impacts on adjacent landholdings. This issue is addressed in the Statewide volume.
- No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness
- partial (proposed action)
- no wilderness/no action

An enhanced wilderness alternative is not analyzed because it would not differ substantially from the all wilderness alternative or increase manageability, nor would any substantial conflicts or problems be resolved by an alternative which acquired the limited inholdings.

All Wilderness

Under the all wilderness alternative 28,340 acres of public land would be recommended suitable for wilderness (see Map 2). For purposes of analysis, it is assumed the 320 acres of State land and the mineral estate of 640 acres of split-estate land would not be acquired.

Energy and Mineral Development Actions

Wilderness designation would close 27,700 acres to all appropriations under the mining and mineral leasing laws. The two split-estate parcels totaling 640 acres and a 320-acre State inholding would be open to mineral entry at the owners' discretion. Slab lava collection from 160 acres would be foregone.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM wilderness management policy. Emphasis would be placed on maintaining mule deer crucial winter range for 10,000 animals. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Livestock Management Actions

Livestock use would remain at the current use level of approximately 1,175 AUMs within the portions of the five allotments within the WSA. The season of use would remain as identified in Table 4 for the five allotments.

Cattle would be trucked to the boundary of the WSA at Ludi Well at the beginning of the season and driven into the study area by horseback. An average of 8 to 12 trips on 2 miles of way into Jack's Place pasture would be made by truck to haul water during the approximately 6 weeks of allocated livestock use each year as practicable alternate means are not available. With this exception, vehicle use on 15.5 miles of ways would be precluded. Five existing waterholes would be maintained by the use of heavy mechanized equipment at approximately 10-year intervals. Cattle management and gathering and maintenance of 7.5 miles of fence would be accomplished by horseback. No range projects are proposed for the WSA.

Recreation Management Actions

The entire 28,340 acres would be closed to vehicle-oriented recreation use. The closure would involve 15.5 miles of ways within the study area. Current recreation visitor use is estimated to be approximately 400 visitor days per year.

Partial (Proposed Action)

Under the partial alternative, 21,010 acres of public land would be recommended suitable as wilderness. It would recommend 7,330 acres of land outside the lava flow as nonsuitable. The boundaries of the suitable area under this alternative would follow the physical edge of the lava flow on the south and the jeep way immediately adjacent to the flow around the rest of the WSA (see Map 3). The mineral-estate of 120 acres of split-estate lands would be acquired by purchase or exchange from willing owners. This alternative would exclude all unnatural features except a small seeded area in the southeast corner of the suitable area. The 360 acres of State land, and 520 acres of the split-estate land, would also be eliminated from the suitable recommendation.

Energy and Mineral Development Actions

Under the partial alternative, 21,010 acres within the WSA (including 120 acres of split-estate land) would be closed to all appropriations under the mining and mineral leasing laws. Development would be foregone on 1,740 acres with high and moderate potential for slab lava and 400 acres with high potential for cinders.

The 7,330 acres found nonsuitable would be open to mineral entry, as would the State and split-estate holdings.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to support existing wildlife populations in accordance with ODFW goals, with emphasis on maintaining crucial deer winter range. The primary manner in which game and nongame wildlife habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Livestock Management Actions

Livestock use would remain at the current use level of 1,175 AUMs. The lava-free area in the eastern portion of the study area (Jack's Place pasture) lies within the suitable acreage; 8 to 12 vehicle trips per year to haul water to livestock in this pasture would be allowed on the existing 2-mile way. With this exception, vehicle use on the 3.5 miles of ways within the suitable portion would be precluded. The gathering of cattle at the end of the season would be accomplished by horseback in all portions of the WSA. No livestock developments are projected.

On the 7,330 acres recommended nonsuitable, vehicle access for livestock management activities would not be restricted and 12 miles of ways would be remain open. Maintenance of 7.5 miles of fence would be accomplished using vehicles, horses, or foot travel. Heavy equipment would be used once every 10 years to maintain five existing waterholes. No livestock developments are projected.

Recreation Management Actions

The 21,010-acre area recommended suitable under this alternative would be closed to motorized vehicle use, including 3.5 miles of ways. The 7,330 acres recommended nonsuitable would be open to vehicles. Recreation use is not expected to change significantly from the current 400 visitor days per year.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 28,340-acres would be open to mineral entry.

Exploration and development would be allowed in the WSA, which contains 1,740 acres with high and moderate potential for slab lava. Exploration would involve surface examination. Surface disturbance would be limited, as only a few slabs would be removed from the lava flow surface. Development is postulated to include two collecting areas: one in the western part and one in the eastern part of the WSA where potential is high (see Map 4). Approximately 120 acres of surface disturbance from collection would occur on the west side of the WSA with an additional 40 acres of disturbance on the east, for a total of 160 acres. Three miles of access roads would be constructed, which would disturb an additional 4 acres.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. Emphasis would be maintained on providing crucial deer winter range for 10,000 mule deer. The primary manner in which habitat is managed is through coordination with livestock grazing allotment management plan goals to assure forage for wildlife. Proposed wildlife projects are four burn-and-seed projects affecting a total of 500 acres abutting the lava flow and four guzzlers to enhance deer habitat.

Livestock Management Actions

Livestock grazing use would continue at the current level of approximately 1,175 AUMs.(see Table 4) Under the no wilderness alternative, all 15.5 miles of ways within the study area would be open to use for livestock management activities. Grazing operations would use the ways approximately 8-12 times per year for water hauling. Maintenance of 7.5 miles of fence would occur using vehicles, horses or foot travel. Heavy equipment would be used once every 10 years to maintain five existing waterholes. No livestock developments are proposed.

Recreation Management Actions

The WSA would be open to vehicle use (although terrain precludes ORV use on the lava flow portion of the WSA), including 15.5 miles of ways. No recreation developments are planned. No change in recreation use numbers is expected.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears to be generally natural. This naturalness is characterized by native vegetation throughout the WSA and by undisturbed lava features. Peripheral to the lava flow the WSA contains sagebrush, native grasses and forbs, with a minimal occurrence of exotic plant species. Scattered occurrences of aspen and ponderosa pine also add to the natural diversity of the area. A wildfire in 1986 burned approximately 500 acres at the northern edge of the WSA. The area is successfully revegetating on the majority of the burn with native bunchgrasses seeded naturally from surviving vegetation.

Unnatural features in the WSA are minimal in size and impact, and are scattered through the lands not covered by lava, affecting approximately 500 acres, less than 2 percent of the WSA. They include five small reservoirs or waterholes, 7.5 miles of pasture fence, 15.5 miles of vehicle ways and a 425-acre seeding (13 years old) in the southeast corner of the WSA. Sagebrush, rabbitbrush and native bunchgrasses have invaded the seeding, making it relatively unnoticeable to the average visitor. The heavy cover of juniper and shrubs and the scattered low hills make the developments unnoticeable in the area as a whole.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The opportunities for solitude are outstanding in the entire WSA. The very irregular surface of the lava flow and the abundant juniper, mountain mahogany and shrub cover readily isolate the visitor. One can have a feeling of total solitude just a few yards into the lava flow. Some areas along the northeastern and southeastern edge of the WSA offer slightly less opportunity for solitude due to the lower stature of the vegetation and flat terrain, yet these areas still afford excellent solitude potential.

The use of vehicles to haul water for cattle approximately twelve times during the grazing season in the Jack's Place pasture on the east side of the WSA has a temporary negative impact on the opportunities for solitude in the immediate vicinity.

Opportunities for primitive and unconfined types of recreation such as day hiking, backpacking, tent-camping, sightseeing, photography, caving and exploring the lava features are excellent. The WSA offers the visitor outstanding views, abundant wildlife, a variety of geological features and a wide diversity of plants. Hiking is very challenging due to the very rough and irregular surface of the lava. The area surrounding the lava flow offers the best terrain for camping and also offers easier access for recreationists unable to cross the rugged lava areas.

Special Features

The WSA is known for its variety of volcanic features, including: sharp and convoluted "aa" lava; flat-featured, smooth-surfaced pahoehoe lava; collapses; tumuli (fractured basaltic domes); cinder cones; squeeze-ups (lava forced through fissures); spires and ropy lavas. Numerous geology students and classes visit the WSA annually to study these examples of volcanism.

Another special feature is the native vegetation in the WSA. The cinder cones are covered almost exclusively with bluebunch wheatgrass. This type of plant community is uncommon in southeastern Oregon. The rest of the flow is covered with a wide array of other native bunchgrasses, wildflowers, colorful lichens, and numerous shrubs and trees including juniper, mountain mahogany, and some ponderosa pine and quaking aspen.

The area contains several kipukas—areas of relatively undisturbed native vegetation in the lava fields. The WSA is located in an ecotone between the sagebrush steppe and ponderosa pine forest and thus contains an assemblage of plants found in both ecosystems. The high quality of the native vegetation is exemplified by the diversity of species and the abundance of plants on the surface of the flow. Desert-sweet, an uncommon shrub, is endemic to lava flows such as this.

The Squaw Ridge WSA is crucial deer winter range for approximately 10,000 mule deer from the Devils Garden deer herd. Elk are also wintering in the area in increasing numbers.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Squaw Ridge WSA is located in the Intermountain Sagebrush Province, with a potential natural vegetation of sagebrush steppe with juniper. The WSA is located in a transition zone between the ponderosa pine forest to the north and the sagebrush steppe to the south.

Vegetative communities listed in the High Lava Plains section of the Oregon Natural Heritage Plan and occurring in the WSA include western juniper/Idaho fescue, big sagebrush/Idaho fescue, mountain mahogany, and Idaho fescue-bluebunch wheatgrass. Other vegetative communities within the WSA include western juniper/big sagebrush/Idaho fescue and bluebunch wheatgrass.

The Squaw Ridge WSA is located within 5 hours' driving of four standard metropolitan statistical areas with populations over 100,000: Medford, Eugene/Springfield, Salem, and Portland, Oregon.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data, results of a BLM geologic/geochemical study, and data provided by Engineer's International, Incorporated (EII), a consulting firm under contract to BLM. The data are contained in an EII report titled "Geological Investigation and Mineral Inventory of Devil's Garden, Four Craters, and Squaw Ridge in Lake County, Oregon." Additional information is drawn from the U.S. Geological Survey Bulletin 1738-A, "Mineral Resources of the Devil's Garden Lava Bed, Squaw Ridge Lava Bed, and Four Craters Lava Bed Wilderness Study Areas, Lake County, Oregon" dated 1988.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume. Table 3 lists the mineral potential classifications for the WSA. Map 4 shows the portions of the WSA rated high and moderate for slab lava and high for cinders.

Most of the WSA is characterized by Quaternary basalt flows with interior, northwest-trending cinder cones. The surface rocks of the outer portions of the WSA are composed of Tertiary to Quaternary vesicular basalt. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

Geothermal energy is the main potential energy resource in the area. Although no specific areas of geothermal potential have been identified in the WSA, the entire study area is considered moderately favorable for the occurrence of geothermal resources, based upon recent volcanism and above-normal heat flow characteristic of most of southeastern Oregon. As of October 16, 1987, there were no leases for any energy resources in the WSA.

Mineral Resources

Part of the WSA (1,740 acres) is rated highly or moderately favorable for the occurrence of slab lava. Four hundred acres are rated highly favorable for the occurrence of cinders. Slab lava occurring near the margins of the Squaw Ridge lava flow is considered exploitable, while interior deposits of slab lava and the cinder deposits are not accessible.

The main mineral deposits within the WSA consist of slab lava (decorative stone) and cinders.

As of October 16, 1987, there were no mining claims within the WSA.

Vegetation

The vegetative communities in the WSA consist mainly of western juniper/big sagebrush/bunchgrass communities. Most of the WSA is covered with a large expanse of lava. Ecological status in the WSA varies from early seral, where recent fires have occurred, to potential natural community vegetation on portions of the lava flow. Potential natural community vegetation surrounding the flow would be western juniper/big sagebrush/Idaho fescue.

Mountain mahogany and juniper are the predominant tree species on the lava flow. Isolated pines and quaking aspen occur along the north end of the flow. Shrubs consist mainly of big sagebrush, bitterbrush, wax currant, desert-sweet, rabbitbrush and oceanspray. The native bunchgrasses are abundant with bluebunch wheatgrass forming pure stands on the cinder cones in the WSA. Thurber's needlegrass, bottlebrush squirreltail, bluegrasses, Junegrass and Indian ricegrass are other common native species.

The lava-associated vegetation has had no livestock use or influence from humans except for minimal fire suppression with hand tools. The lava-free peripheral lands are composed of sagebrush, rabbitbrush and bunchgrass openings surrounded by stringers of juniper and Idaho fescue.

Wildlife

The Squaw Ridge WSA is totally within crucial winter range for the Devils Garden deer herd, providing thermal cover and forage for one-quarter to one-third of the herd (10,000 deer). In recent years, elk have begun moving back into their historic range in and around the WSA. ODFW has not yet specified management goals for elk in the area.

Other wildlife species which inhabit or frequent the WSA include cougar, bobcat, porcupine, badger, yellow-bellied marmots, ground squirrels, bats, western rattlesnake, gopher snakes, fence lizards and other reptiles. Avian species include bald eagle, red-tailed and rough-legged hawks, prairie falcon, great horned owl, turkey vulture, raven, loggerhead shrike, western tanager, mountain bluebirds and other perching song birds. Northern bald eagle, Federally listed as threatened in Oregon, have occasionally been observed in the area, however, the WSA does not contain nesting habitat for bald eagle and does not represent any significant aspect of habitat to this species.

The only existing habitat development in the WSA for wildlife is the crested wheatgrass seeding to benefit deer at the southeast corner of the WSA.

Watershed

There are no perennial streams or springs in the WSA.

Livestock Grazing

Portions of five grazing allotments are within the Squaw Ridge WSA with a total of approximately 1,175 AUMs used by livestock. Table 4 illustrates the existing livestock management situation.

Existing range developments (among the unnatural features listed in the Naturalness section) include five reservoirs and waterholes and 7.5 miles of fence. Grazing operators use the vehicle ways for salting and checking livestock approximately twelve times per year. Cattle are usually gathered by horseback.

Recreation Use

Recreation use is related mostly to hunting, sightseeing, photography, hiking, rockhounding and cave exploration. Most of the vehicle-oriented recreation is related to hunting, and this occurs primarily in a small area on the margins between the lava flows and the boundary roads. The remainder of the WSA is inaccessible to vehicles.

The margin areas and the islands on the east side of the WSA where geologically recent lava flows do not occur offer the best camping locations. The interior of the flows is so rugged that good camping areas are limited. The margin areas also offer primitive recreation opportunities to those who may not be able to traverse the extremely rugged interior.

Visitor days are estimated to be approximately 400 per year. Typically, recreation in the area is associated with vehicle access into the northern and southern portion of the WSA with limited excursions into the flows for sightseeing or hunting. Portland State University studies indicate an approximate 100 percent increase in regional population by the year 2000. This increase is disputed as excessive by local Chambers of Commerce and business sources, however population growth is projected to continue in the region (Bend-La Pine) with an increasing use of surrounding desert areas for recreation. Increases in this WSA are approximately 20 visitor days per year as a result of this population trend.

Local Personal Income

Livestock use at the current level of 1,175 AUMs and recreation use totaling 400 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $14,100 for livestock grazing and $4,800 related to recreation use, for an overall total of $18,900. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in the Squaw Ridge WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide EIS volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 28,340 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and wilderness values within the entire 28,340 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude, and primitive and unconfined recreation would be preserved. Special features including the variety of geologic features in the lava flow, vegetative communities composed almost totally of bluebunch wheatgrass (uncommon in southeastern Oregon), crucial deer winter range, and elk range would also be protected. Wilderness values of solitude and opportunities for primitive and unconfined recreation would be enhanced by the closure of 15.5 miles of ways.

Naturalness

The naturalness of the area's vast lava expanses and surrounding landscape would be enhanced by prohibiting motorized vehicle use and surface collection of slab lava. The elimination of vehicle traffic from 13.5 miles of ways would allow for revegetation of the parallel tracks within 3 to 5 years, thus enhancing the naturalness of the WSA. Water hauling into the Jack's Place pasture approximately 8-12 times per use period would prevent rehabilitation of approximately 2 miles of ways. The existing 425-acre seeding in the WSA would continue to revegetate and further reduce the impact of this unnatural feature as native species become even more dominant in the visual perspective of the area.

Solitude

The highly convoluted surface of the lava which covers approximately 70 percent of the WSA affords the visitor excellent opportunities for solitude. Opportunities for solitude outside the lava flow would be enhanced under the all wilderness alternative due to the restriction of motor vehicles and the prohibition of mechanical disturbance in this open area. Opportunities for solitude in the east side of the area would be disrupted approximately 8-12 times during the grazing use period by trucks hauling water in the Jack's Place allotment. Waterhole maintenance would have a short-term impact approximately every 10 years.

Primitive and Unconfined Recreation

Closure of the WSA (affecting 15.5 miles of ways) to motorized travel associated with recreation use and restrictions on such travel for livestock management activities would increase opportunities for primitive and unconfined recreation by improving the primitive recreation setting, particularly in the lava-free margins of the study area. Revegetation of ways would enhance the wilderness experience for hikers and backpackers by providing a more natural landscape.

Special Features

Wilderness designation of the entire 28,340 acres of the Squaw Ridge WSA would preserve the unique geologic features by precluding the collection of slab lava from 1,740 acres. Essential habitat for crucial deer winter range, elk habitat, significant vegetative features in kipukas, and the unique bluebunch wheatgrass community on Lava Mountain would also be preserved under this alternative.

Conclusion: Wilderness designation of the entire 28,340 acres would result in protection or enhancement of existing wilderness values.

Impacts on Energy and Mineral Development

A total of 27,700 acres would be closed to energy and mineral entry; the 640 acres of split-estate in the WSA would be open to energy and mineral entry, as would the 320 acres of State land.

Energy Development

Exploration and development for energy resources would be prohibited on 27,700 acres. All of this acreage is rated moderately favorable for the occurrence of geothermal energy, based on indirect evidence. The 640 acres in split-estate parcels, and 320 acres of State land, would be open to energy entry. Due to a lack of geologic evidence, difficult access and a lack of past interest, only casual exploration, without development, is expected.

Conclusion: No impact on energy development is expected.

Mineral Development

The 1,740 acres with high and moderate potential for slab lava and 400 acres with high potential for cinders would be closed to mineral entry, precluding the projected development of 20 acres for two slab lava removal sites.

Conclusion: This alternative would have a slight impact on mineral development as two slab-lava collecting sites would be foregone.

Impacts on Vegetation

The all wilderness alternative would preserve and protect native vegetation within the WSA, including the bluebunch wheatgrass community on the cinder cone, the undisturbed native vegetation in the kipukas and the desert-sweet which grows on the surface of the lava flow and the native bunchgrass-sagebrush and juniper areas outside the flows. The 13.5 miles of vehicle ways closed to vehicles would revegetate within 3 to 5 years. Two miles of ways used for water hauling would not revegetate.

Conclusion: Native vegetation would be preserved and protected under this alternative; 13.5 miles of ways would revegetate.

Impacts on Wildlife

Wildlife habitat and natural interrelationships for all species which inhabit or frequent the WSA would be protected under this alternative, particularly the predator-prey relationship associated with the deer winter range. The elimination of vehicles would prevent the harassment of wintering deer in the WSA. ODFW management goals would be met for game and nongame species. Increasing elk populations have not been incorporated at present in management goals, therefore no accurate projection of impact on this species is possible at the present time.

Under wilderness management guidelines, four proposed burn-and-seed projects (totalling approximately 500 acres) and the installation of four wildlife guzzlers to enhance deer habitat would not be allowed as they are not necessary for the continued existence or welfare of wildlife. The WSA's current winter herd size of approximately 10,000 deer would continue at present levels.

Conclusion: Crucial deer winter range for 10,000 mule deer, and habitat for existing population levels of other game and nongame species would be maintained.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 1,175 AUMs within the WSA. Vehicle use for livestock management on 13.5 miles of ways would be eliminated. Use would continue on 2 miles of way to haul water into the Jack's Place pasture 8-12 times per use season. Maintenance of five waterholes would require short-term use of motorized equipment at approximately 10-year intervals. A minor increase in operating costs might result from the shift from motorized vehicle management to management by horseback for the checking and salting of livestock and maintenance of 7.5 miles of fence.

Conclusion: Livestock grazing use would remain at 1,175 AUMs, vehicle use would be precluded on 13.5 miles of way with minor inconvenience and slight increase in cost to livestock operators.

Impacts on Recreation Use

Under this alternative, 28,340 acres, including 15.5 miles of ways, would be closed to vehicle-dependent recreation use on the lava-free margins of the WSA (most of the study area is too rough for vehicle use). An estimated 100 visitor days per year of use directly associated with vehicle-oriented recreation would be foregone, however, primitive types of recreation would be enhanced and increase to offset the non-primitive decline. Due to the relatively short distances between the boundary and the lava flow, much of the current hunting use pursued as a nonprimitive activity would continue as a primitive activity. Regional population increases would be expected to produce slight increases in recreation use of approximately 10 visitor days per year over the next several decades.

Conclusion: The overall level of recreational use would remain at current levels of approximately 400 visitor days per year, with slight growth of 10 visitor days per year due to population increases.

Impacts on Local Personal Income

Livestock grazing would remain at 1,175 AUMs and recreation use is expected to remain at approximately 400 visitor days per year. Table 5 shows the effects on local personal income generated from these activities. There would be no net change in local personal income.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $19,000.

Partial Wilderness(Proposed Action)

Recommended suitable for wilderness: 21,010 acres
Recommended nonsuitable for wilderness: 7,330 acres

Impacts on Wilderness Values

The partial alternative would recommend 21,010 acres suitable for wilderness designation. The wilderness values of naturalness, solitude, opportunities for primitive and unconfined recreation, and special features would be preserved and protected within these 21,010 acres. Under this alternative, an attempt would be made to acquire the mineral estate of 120 acres of split-estate land through purchase or exchange with willing owners, thereby enhancing wilderness values.

The 7,330 acres outside of the lava flow would be recommended nonsuitable for wilderness. This alternative would eliminate from the area recommended suitable all unnatural features (except a small seeded area in the southeast corner), the State land, and most of the split-estate lands.

Naturalness

Naturalness within the 21,010 acres recommended suitable would be preserved, although landform and vegetative communities would be less diverse than in the all wilderness alternative due to the elimination of most of the lava-free portions of the WSA. Geologic features and other wilderness values in the lava flow would be protected. Water hauling in the Jacks Place pasture would prevent revegetation on 2 miles of ways. The small seeding in the southeast corner of the WSA would be included in the suitable acreage. The exclusion of 12 miles of ways, five reservoirs and 7.5 miles of fenceline contained in the nonsuitable portion would remove most unnatural features from the area recommended suitable for wilderness.

Solitude

Opportunities for solitude would be preserved and protected within the 21,010 acres recommended suitable. Short-term impacts to solitude would occur due to water hauling during grazing use periods.

Opportunities for solitude in the 7,330 acres recommended nonsuitable would continue to be affected by recreational vehicle use associated with hunting and nonprimitive recreation, as well as livestock grazing management activities on 12 miles of ways, which would include checking cattle, salting, fence maintenance and the maintenance of five waterholes on a 10-year cycle.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be preserved within the 21,010 acres recommended suitable, although camping areas would be limited due to the rugged nature of the lava flow.

Opportunities for primitive and unconfined recreation would continue to be impaired on 7,330 acres due to vehicle access. The best camping areas and easiest hiking terrain in the WSA are located in this portion which is not covered with rugged lava flows.

Special Features

The geologic features of the lava flow, the pure stands of bluebunch wheatgrass and the kipukas would be preserved under this alternative. Crucial mule deer winter range would be protected on 21,010 acres.

The 7,330 acres recommended nonsuitable are within crucial deer winter range. Wintering animals would be subject to continued harassment due to motor vehicle access on 12 miles of ways, affecting approximately 300 acres.

Conclusion: Wilderness designation of 21,010 acres would protect existing wilderness values. Within the 7,330 acres not designated wilderness, wilderness values would be directly and indirectly impaired on approximately 430 acres due to continued vehicle access, recreation use, and other management practices, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Under the partial alternative, approximately 21,010 acres would be closed to energy and mineral entry including 120 acres of split-estate if the mineral estate is acquired. The remaining 7,330 acres would be open to mineral entry, as would the 320 acres of State land.

Energy Development

Exploration and development for energy resources would be prohibited on 21,130 acres, assuming acquisition of the 120 acres of mineral estate. The remaining 7,330 acres would be open for mineral entry. No energy exploration or development is postulated to occur on the 21,130 acres rated moderate for geothermal resources due to a lack of geologic evidence, difficult access, and a lack of past interest.

Conclusion: No impacts to energy development are expected.

Mineral Development

The 1,740 acres with high and moderate potential for slab lava and the 400 acres with high potential for cinders would be closed to mineral entry. Development of two collecting areas for slab lava would be precluded.

The 7,330 acres recommended nonsuitable would remain open to mineral entry, although no exploration or development is anticipated as geologic evidence is lacking for any moderate or high mineral potential. Conclusion: Production from two collecting areas for slab lava would be foregone in the suitable portion. No impact would occur in the nonsuitable portion as no exploration or development is expected.

Impacts on Vegetation

Vegetation would be preserved in the area recommended suitable (bluebunch wheatgrass community, native vegetation in the kipukas, desert-sweet on the lava flow). The 12-miles of vehicle ways would not revegetate in the nonsuitable portion, nor on the 2-miles of way used for water hauling.

Conclusion: Natural vegetative composition would be preserved on 21,010 acres; 14 miles of vehicle ways would not revegetate.

Impacts on Wildlife

Wildlife habitat would be preserved on 21,010 acres under the partial alternative. Proposed seeding and guzzler projects to benefit deer would not be allowed in the portion recommended suitable, thus foregoing an opportunity to enhance deer habitat on 500 acres. The deer and the elk wintering areas within the portion recommended nonsuitable would be subject to continued incursion by motorized vehicles, resulting in continued disturbance of the animals.

Conclusion: Crucial deer winter range would be preserved on 21,010 acres. The opportunity to enhance deer habitat on 500 acres would be foregone. Wintering deer would be subject to continued vehicle disturbance on 7,330 acres.

Impacts on Livestock Grazing

Grazing use levels would remain at 1,175 AUMs. Under this alternative, 12 miles of ways in the study area would remain open to unrestricted vehicle access for livestock management activities. The 2 miles of ways within the Jack's Place pasture would require 8 to 12 truck trips per grazing period for water hauling, as no alternative to motorized transport is feasible. Livestock are gathered by horseback from within the WSA.

Conclusion: Use levels would remain at 1,175 AUMs. Restrictions on vehicle access for water hauling on 2 miles of way would cause minor inconvenience for the livestock operator. No impacts would occur in the nonsuitable 7,330 acres.

Impacts on Recreation Use

A slight increase in primitive recreation would accompany wilderness designation even though the diversity of primitive recreation activities would be reduced under this alternative. Many of the best camping areas would be outside of the area recommended suitable. Vehicle-related recreation would not be significantly affected, although 2.5 miles of way would be closed to vehicle access on the east side of the area. Visitor days would remain at approximately 400 per year. Population increase would produce an increase of approximately 10 visitor days per year.

Conclusion: Primitive recreation potential would be preserved on 21,010 acres. Vehicle-related recreation would continue on 7,330 acres. No substantial change in the number of visitor days per year is expected.

Impacts on Local Personal Income

Livestock grazing would remain at 1,175 AUMs and local personal income derived from it would not change. Recreation use numbers are not expected to change substantially, therefore income derived from it would remain unchanged. Table 5 shows the effects on local personal income generated from these activities.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $19,000.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 28,340 acres

Impacts on Wilderness Values

Under this alternative, the entire 28,340 acres would not be designated wilderness and wilderness values would not receive special legislative protection. The wilderness value of naturalness would be reduced by the implementation of wildlife projects on approximately 500 acres peripheral to the lava flow. Damage to geological features, vegetation, and other wilderness values would result from slab lava removal inside the flow.

Naturalness

The naturalness of the Squaw Ridge WSA would be reduced outside the lava flow by continued unconstrained vehicle use. Projected vegetative manipulation and structural developments for wildlife would visually affect approximately 800 acres. Development of two collection sites for slab lava would directly affect naturalness on 160 acres. Three miles of roads associated with this activity would directly impact 4 acres.

Solitude

Opportunities for solitude outside the lava flow would continue to be reduced by vehicle use on and off the 15.5 miles of ways, affecting approximately 300 acres visually and by the sounds of vehicle activity. Within the flow, slab lava removal on 160 acres would locally affect solitude during the mining process. Continued water hauling and maintenance of livestock developments would disturb solitude on a periodic basis.

Primitive and Unconfined Recreation

The continued motorized recreation use in the area would restrict primitive recreation opportunities, primarily in the vicinity of the 15.5 miles of ways. Exploitation of the slab lava resource and associated disturbance would degrade the quality of primitive recreation opportunities surrounding collection areas and roads. These combined activities would affect the primitive setting on approximately 1,000 acres.

Special Features

The hunting pressure on deer and elk herds due to vehicle access would continue to place stress on these game populations. The removal of slab lava would alter the geologic features of the lava flow on 20 acres.

Conclusion: In the absence of wilderness designation, projected future activities would directly or indirectly impair wilderness values on approximately 2,000 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

No acreage would be withdrawn under the no wilderness alternative.

Energy Development

Exploration and development for energy resources would be allowed within the WSA although none is anticipated due to a lack of geologic evidence, difficult access and lack of past interest.

Conclusion: No impacts to energy development are expected.

Mineral Development

All 28,340 acres would be available for mineral entry. Development of two collecting areas for slab lava would be projected, affecting approximately 160 acres.

Exploration and development of the area's 400 acres with high potential for cinders would be allowed, however such development is not postulated due to the difficultly and high cost associated with access to the resource.

Conclusion: Slab lava resource would be developed on approximately 160 acres.

Impacts on Vegetation

Vegetation diversity in the WSA would be reduced by proposed burn-and-seed projects on 500 acres, which would change vegetative composition from sagebrush, rabbitbrushes and native grasses to crested wheatgrass and legumes. Vegetation would also be impacted by slab lava removal on 20 acres and on 3 miles of roads impacting 4 acres.

Conclusion: A no wilderness action would alter or remove vegetation on approximately 520 acres.

Impacts on Wildlife

Proposed vegetative manipulation on approximately 500 acres to enhance the nutrition of the deer, and four guzzlers to improve water availability for all wildlife would be allowed. Continued vehicle access would lead to continued stress on wildlife populations within the WSA.

Conclusion: Wildlife would benefit from guzzler installation and deer would benefit from burn and seed projects on 500 acres. Vehicle use would continue stress on deer and elk during hunting seasons.

Impacts on Livestock Grazing

Livestock would benefit from proposed wildlife developments. Vehicle use for livestock management activities within the WSA would not be restricted and grazing use would remain at the current level of 1,175 AUMs.

Conclusion: The no wilderness alternative would have no impact on current livestock management activities.

Impacts on Recreation Use

Motorized recreation would continue where terrain permits. Primitive types of recreation use would be reduced due to continued use of motorized vehicles and by wildlife projects that would impair the naturalness of the landscape. Overall recreation use under this alternative is projected to remain stable or increase slightly, by about 10 visitor days per year, based on Portland State University population studies for the region projecting expected population growth of local communities.

Conclusion: No change in recreation use numbers is expected.

Impacts on Local Personal Income

Livestock grazing would remain at 1,175 AUMs and recreation use would remain relatively stable at approximately 400 visitor days per year. Slab lava resources would be developed on 160 acres, resulting in an unknown level of increase in local personal income.

There would be no net increase in local personal income, except for an unknown level of increase attributable to the projected mineral development, as shown in Table 5.

Conclusion: Annual local personal income generated from resource outputs would increase from $19,000 by an unknown amount.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (partial alternative), wilderness values would be lost and primitive recreation opportunities would be reduced in the area outside the lava flow due to continued vehicle access on 12 miles of ways which visually affect approximately 230 acres within the WSA.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, all short-term uses would continue and future development options on 7,330 acres would remain open, while the enhancement of long-term productivity of wilderness values would result on 21,010 acres. Approximately 230 acres within the designated wilderness would be visually affected by projected actions on the nonsuitable acreage.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, wilderness designation would commit 21,010 acres to wilderness protection and there would be no irreversible or irretrievable commitment of the wilderness resource on these lands. Non-designation of 7,330 acres would irreversibly commit resources subject to consumptive use such as vehicle access on 15.5 miles of ways affecting approximately 300 acres resulting in irretrievable and irreversible impacts upon the wilderness values within the area from mineral production on 20 acres.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The areas recommended suitable under the all wilderness and the partial (proposed action) alternatives would be easily managed as wilderness.

Rationale for the Selection of the Proposed Action

The partial alternative is the Proposed Action because it would preserve the portion of the WSA with the most wilderness values, including volcanic features of scenic and educational value, and native bunchgrass communities. The benefits of preserving these values would outweigh the benefits of keeping the areas open to such conflicting activities as mineral development. The partial alternative is preferred over the all wilderness alternative because it would allow maintenance of grazing and wildlife projects outside the lava flow while preserving the primary wilderness values within the flow.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to the Squaw Ridge WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness

Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: There is a lack of analysis for demand for mineral resources and of economic feasibility of minerals development. **Response:** The development scenarios provided in the final EIS take into account such factors as anticipated demand and economic feasibility.

Comment: There is a lack of analysis of the impact of crested wheatgrass seedings on nongame wildlife species. **Response:** New seedings are allowed only in the no wilderness alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Squaw Ridge Lava Bed WSA (OR-1-3)

Proposed Management	All Wilderness	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	28,340	21,010	0
Acres Closed to ORVs by Wilderness Designation[1]	28,340	21,010	0
Miles of Ways Closed	15.5	3.5	0
Miles of Roads Constructed	0	0	3
Acres of Mineral Estate Acquired[2]	0	120	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	27,700	20,890	0
Number of Slab Lava Sites Developed	0	0	2
Wildlife Projects Developed:			
Burn-and-seed (acres)	0	0	500
Guzzlers (number)	0	0	4

[1] Except for 15.5 miles of ways in the WSA, most of the acreage shown is already closed to cross-country vehicle use through a "limited" ORV designation.

[2] Upon acquisition of the mineral estate, these lands would be withdrawn from mineral location and leasing

Table 2. Summary of Environmental Consequences of Alternatives, Squaw Ridge Lava Bed WSA, (OR-103)

Resource or Activity	All Wilderness	Partial Wilderness (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 28,340 acres would protect or enhance existing wilderness values.	Wilderness designation of 21,010 acres would protect wilderness values. Values directly impaired on 430 acres.	Projected management actions would impair the area's naturalness, solitude and recreation opportunities on 2,000 acres.
Energy and Mineral Development	Slab lava sale foregone on 20 acres. No impact on energy development since none projected.	Slab lava foregone on 20 acres. No impact on energy development since none projected.	Slab lava sale on 20 acres. No impact on energy development since none is projected.
Vegetation	14 miles of ways would revegetate; native vegetation preserved on 28,340 acres.	14 miles of ways would not revegetate. Native vegetation preserved on 21,010 acres.	Vegetation altered on 520 acres.
Wildlife	Habitat and populations of all species, including crucial deer winter range, preserved on 28,340 acres.	Crucial deer winter range preserved on 21,010 acres. Habitat impacted by vehicles on 7,330 acres.	500 acres seeded to enhance forage. One guzzler installed. Continued vehicle impacts on habitat.
Livestock Grazing	Vehicle use on 13.5 miles of ways foregone. No change in use levels of 1,175 AUMs.	No change in use levels of 1,175 AUMs.	No impact.
Recreation Use	Types of use would shift from motorized to primitive. No substantial change in visitor	No substantial change in use. (10 visitor days/year due to to population increase.)	No impact.
Local Personal	Annual local personal income would remain at approximately $19,000.	Annual local personal income would remain at approximately $19,000.	Local personal income would increase by an unknown amount above the present $19,000.

Table 3. Classification of Energy and Mineral Potential, Squaw Ridge Lava Bed WSA (OR-1-3)

Commodity	Area	Level of Potential	Level of Certainty
Metals (Gold, Silver, Mercury)	Entire WSA	L	B
Geothermal	Entire WSA	M	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	0	C
Bentonite	Entire WSA	0	B
Diatomite	Entire WSA	L	B
Zeolites	Entire WSA	0	B
Slab Lava	See Map 4	H	D
	See Map 4	M	D
	Rest of WSA	L	C
Cinders	See Map 4	H	D
	Rest of WSA	0	C

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

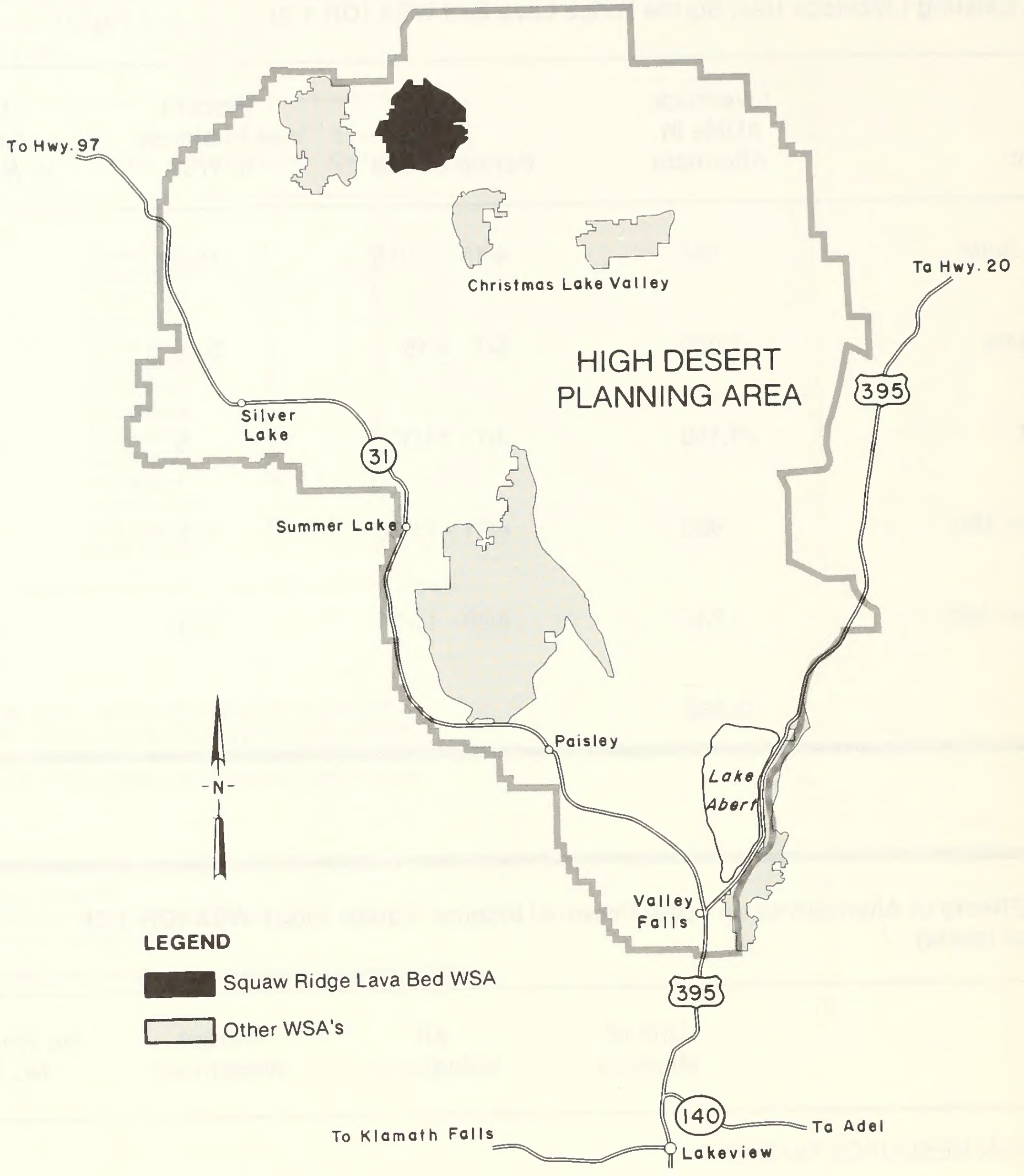
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

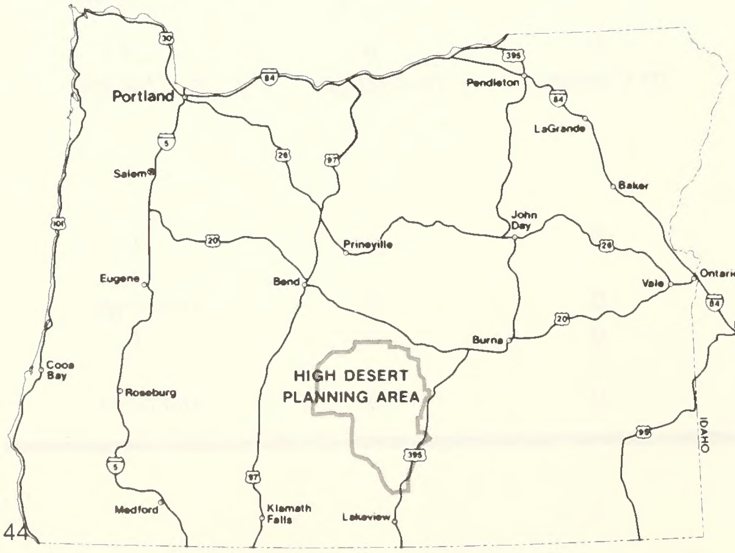
Table 4. Existing Livestock Use, Squaw Ridge Lava Bed WSA (OR 1-3)

Grazing Allotment	Livestock AUMs in Allotment	Period of Use	Percent of Allotment in WSA	Current Actual Use in WSA (AUMs)
Hogback Butte (No. 910)	680	4/15 - 12/15	15.5	170
Squaw Butte (No. 915)	1,000	5/1 - 9/15	50.4	437
Viewpoint (No 103)	29,169	3/1 - 11/30	.5	253
East Green Mtn. (No 101)	980	4/21 - 11/30	10.2	197
West Green Mtn. (No 914)	1,233	4/26 - 11/25	4.9	118
Total	33,062			1,175

Table 5. Effects of Alternatives on Local Personal Income, Squaw Ridge WSA (OR-1-3) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	no change	no change	no change
Mineral Development:				
Non-metallic mines	Number	0	0	2
Recreation Use	RVD	no change	no change	no change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	0	0	0
Mineral Development:				
Non-metallic mines	$	0	0	unknown
Recreation Use	$	0	0	0
Total	$	0	0	unknown





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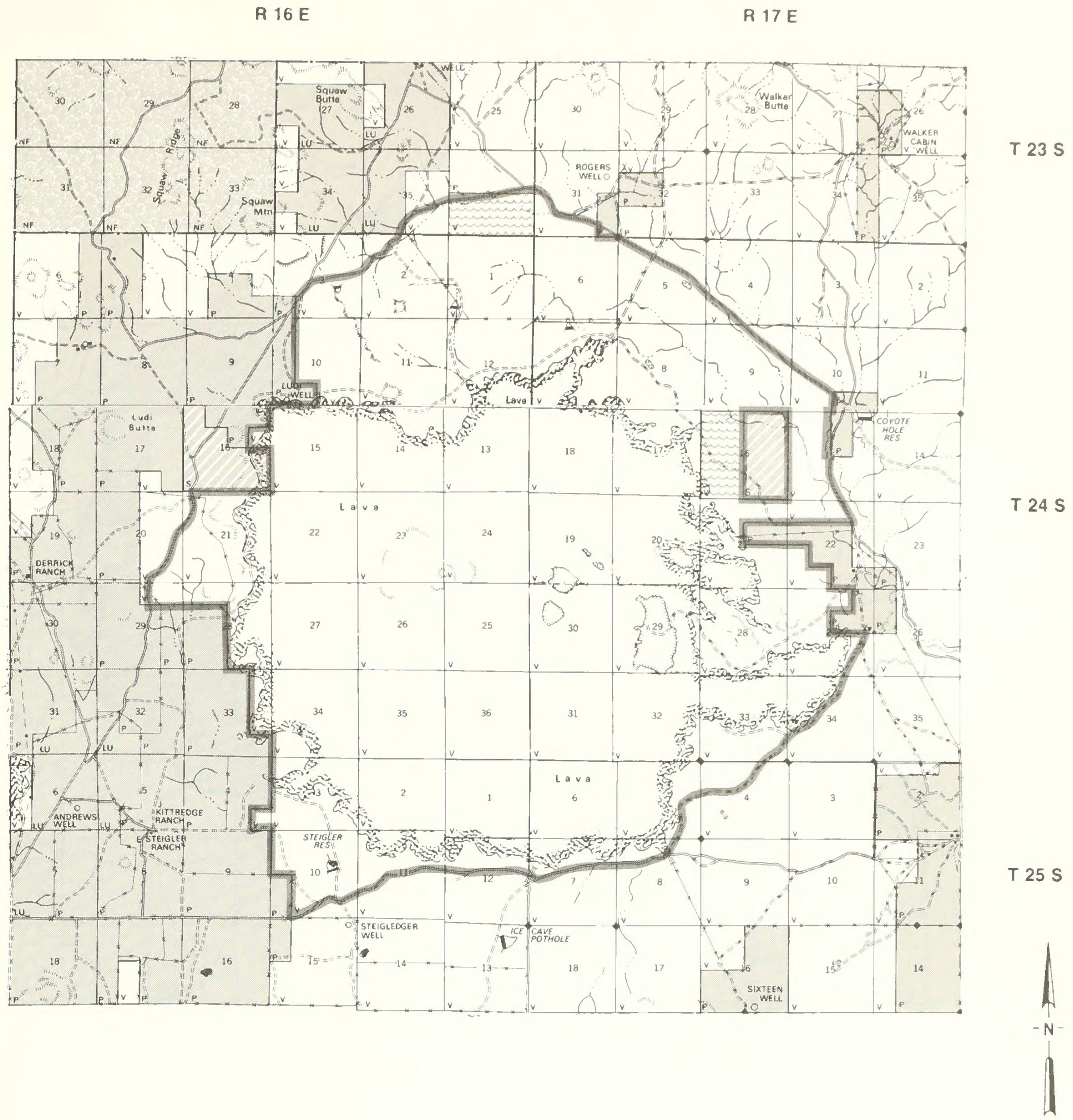
Squaw Ridge Lava Bed WSA
OR-1-3

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▭ BLM Land in WSA Studied Under Section 603 of FLPMA
- ▬ Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▨ State
- ▩ Private
- ▦ U.S. Forest Service
- ▤ BLM Surface-State or Private Subsurface (Split Estate)
- ▓ Edge of Lava

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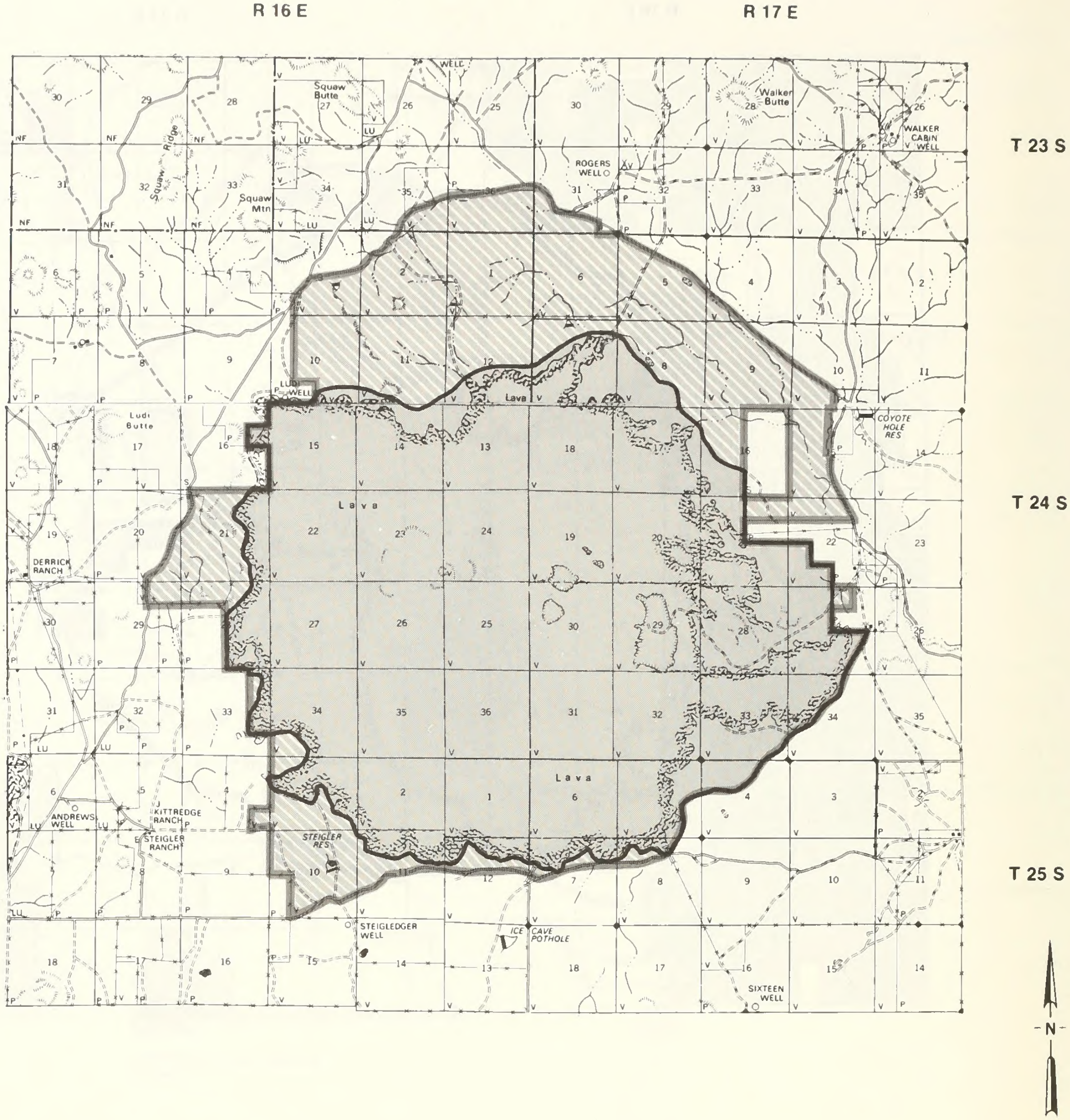
Squaw Ridge Lava Bed WSA
OR-1-3

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

■ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

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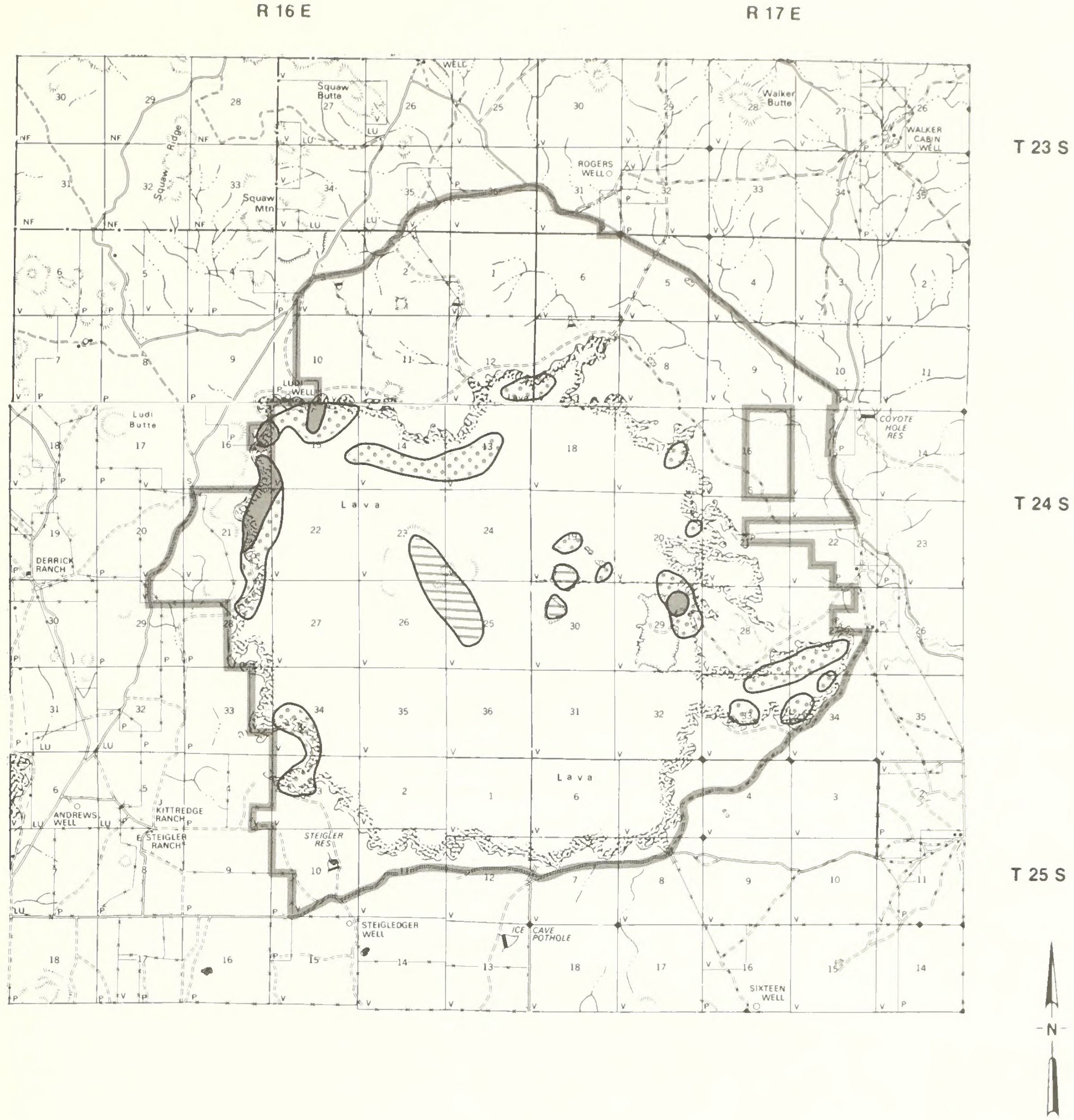
Squaw Ridge Lava Bed WSA
OR-1-3

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



■ **High Potential (HD) for Slab Lava**

▒ **Moderate Potential (MD) for Slab Lava**

▤ **High Potential (HD) for Cinders**

Entire WSA:
Moderate Potential
(MB) for Geothermal Resources

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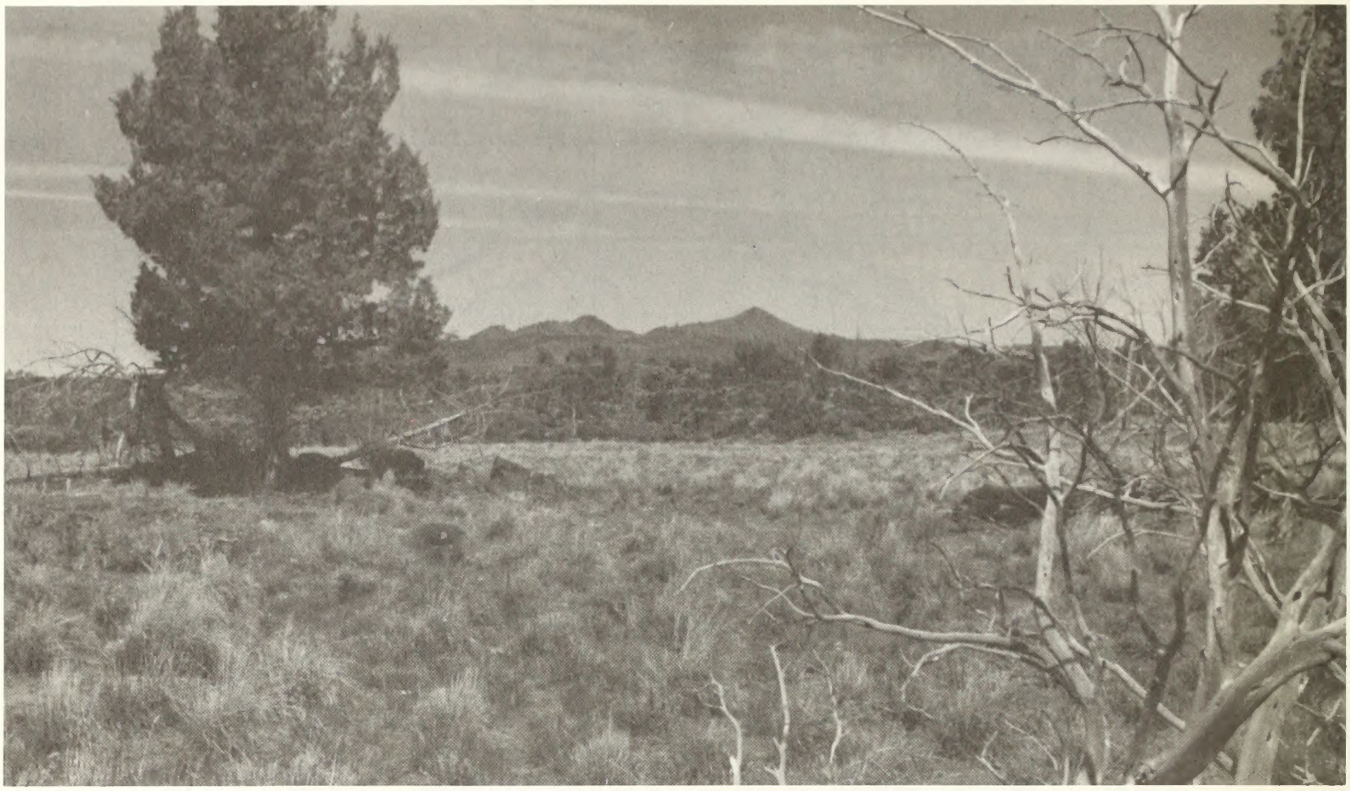
Squaw Ridge Lava Bed WSA
OR-1-3

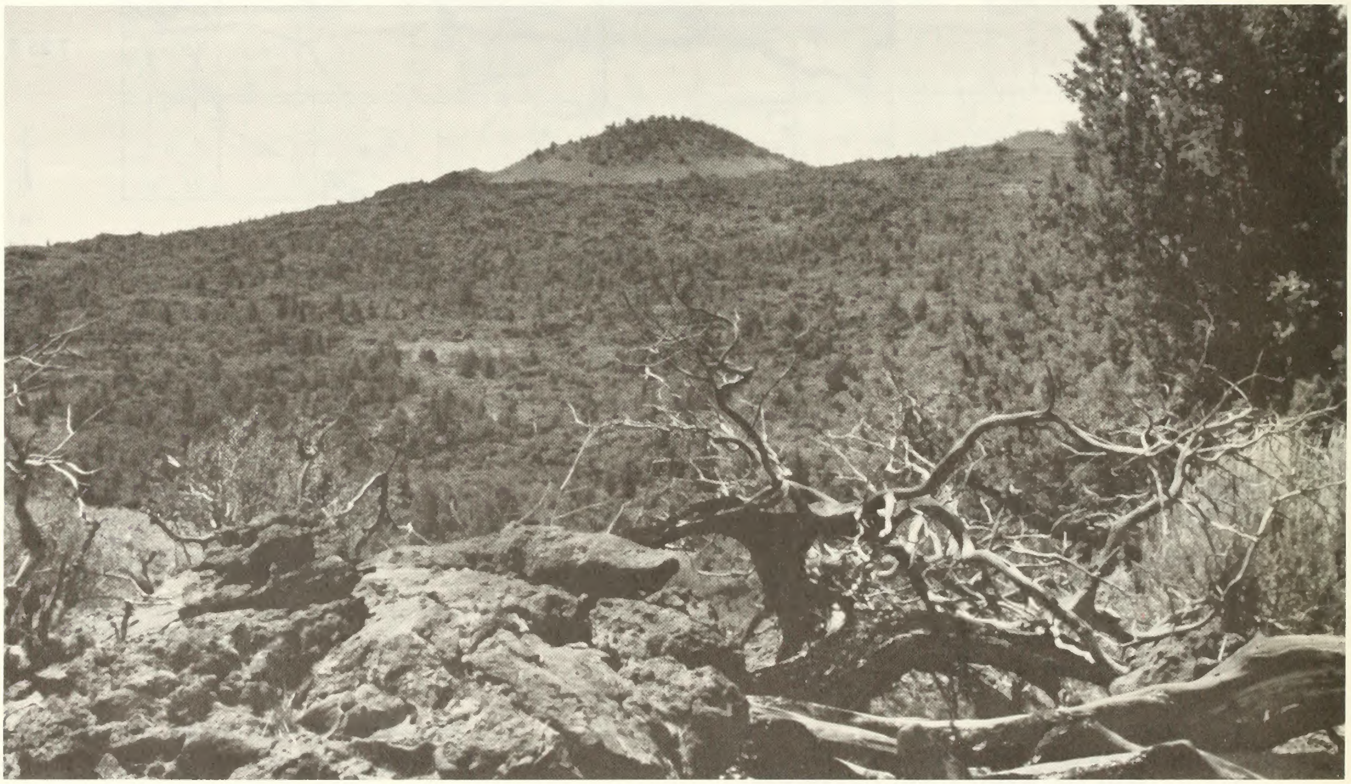
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Squaw Ridge Lava Bed WSA, OR-1-3. In the southwest corner of the WSA looking north. The lava flow in the background is within the area recommended suitable under the partial (proposed action) alternative; the juniper and grassland community in the foreground is recommended nonsuitable under the partial (proposed action) alternative. May 1982.



Squaw Ridge Lava Bed WSA, OR-1-3. In the east-central portion of the WSA looking southwest froma cinder cone across a lava flow. Within area recommended suitable under the partial (proposed action) alternative. Typical of the terrain in the core of the WSA. May 1982.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Four Craters Lava Bed Wilderness Study Area (OR-1-22)

1. Introduction

General Description of Study Area

The Four Craters Lava Bed Wilderness Study Area is approximately 60 miles southeast of Bend, Oregon and 8 miles north of the small town of Christmas Valley in Lake County (see Map 1). Located about 25 miles east of Oregon State Highway 31, the WSA can be reached by county roads to Christmas Valley and then a BLM dirt road north.

Roughly oval in shape, the study area contains 12,600 acres, all of it public land (see Map 2). The boundaries are defined by a low standard dirt road on the west and north and by private land on the east and south. A low standard dirt road bounds the WSA on the southeast for approximately 2 miles. A dead-end road extends approximately 1.7 miles into the WSA, forming part of the northern boundary. Another dead-end road extends for approximately .25 miles into the vault toilet at Crack in the Ground. This road and the vault toilet are excluded from the WSA. The lands adjacent to the WSA are BLM except for private land on the east for approximately 1 mile on the southern boundary.

About half of the acreage in the WSA contains rugged aa lava flows and cinder cones. The remaining acreage is sagebrush/juniper and sagebrush/grassland flats. The WSA contains the "Crack in the Ground," a large tension crack in the basalt approximately 2 miles long and from 10 to 30 feet in depth. This crack reaches a maximum width of about 20 feet. Two other tension cracks, volcanic spires and pressure ridges also occur within the lava flow.

Interrelationships

The Four Craters WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) 2,045-square-mile Paulina Wildlife Management Unit and is crucial winter range for the Devils Garden deer herd. Between 2,000 and 3,000 mule deer use the 20 square miles of the WSA for some or all of their winter habitat. ODFW management goals include a ratio of 15 bucks per 100 does of mule deer. The goal for nongame wildlife is to maintain populations of naturally-occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for analysis in this WSA include:

- impact on wilderness values, especially on the more accessible lands outside the lava flow,
- impact on development of cinder and slab lava resources,
- impact on native vegetation of scientific interest in the kipukas,
- impact on water-hauling for livestock,
- impact on crucial mule deer winter range and on bald eagle wintering habitat,

- impact on recreation use levels, including access to Crack in the Ground, and
- impact on the use of two internal dead-end roads.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development action planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness
- Proposed Action
- partial
- no wilderness/no action

An enhanced wilderness alternative which would include acquisition of the mineral estate of split-estate lands is not analyzed because it would not significantly differ from the all wilderness alternative. No feasible opportunity to enhance wilderness values by closing interior roads or acquiring adjacent private land was identified.

All Wilderness

The all wilderness alternative would recommend all 12,600 acres of public land in the WSA suitable as wilderness (see Map 2). For purposes of analysis, this alternative assumes the mineral estate of the split-estate land would not be acquired and that the dead-end roads would remain open. The area would include all of the lava flows, the Crack in the Ground and the sagebrush/juniper lands that surround the flow, and 640 acres of split-estate land.

Energy and Mineral Development Actions

Under the all wilderness alternative, 11,960 acres would be closed to all forms of mineral entry. This includes 110 acres with high potential for slab lava and 90 acres with moderate potential for slab lava. Due to difficult access and minor deposits, no development is projected. The area has 40 acres with high potential for cinders. One 10-acre cinder pit would be foregone. The 640 acres of split-estate land would be open to mineral and energy exploration and development, approximately 40 acres of which has a moderate potential for the occurrence of slab lava. No development is projected.

Wildlife Habitat Management Actions

Habitat would be managed to protect crucial winter range for 2,000 to 3,000 mule deer in accordance with ODFW management goals and in a manner consistent with BLM Wilderness Management Policy. The primary way this would be accomplished would be by closely coordinating the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the current level of 623 AUMs and the season of use identified in Table 4. Vehicle use on 8.5 miles of ways would be precluded except for water hauling necessitating 10 trips into the East Green Mountain allotment and daily water hauling into the east pasture of the Crack in the Ground allotment during use periods. Water hauling would occur on 1 mile of way and 1.7 miles of road. No practical alternatives exist for providing livestock water in these allotments. Maintenance on 5.5 miles of fence would be accomplished by horseback or on foot. Livestock movement and gathering would be done by horseback.

Wood Products Actions

Wood products harvest (juniper cutting) would be prohibited on 12,600 acres, approximately 1,500 of which contain juniper which could be cut for firewood. Current demand is met by designated areas outside the WSA.

Recreation Management Actions

The entire 12,600 acres, including 8.5 miles of ways, would be closed to motorized vehicle use. The .25-mile dead-end road to Crack in the Ground and the vault toilet site at Crack in the Ground would remain open to vehicle access. The 1.7-mile dead-end road in the northeastern portion of the WSA would also remain open to vehicles. Current recreational use in the WSA is estimated to be approximately 3,500 visitor days per year, primarily associated with day-use at Crack in the Ground.

Proposed Action

The proposed action would recommend 9,100 acres suitable as wilderness. In addition, this alternative assumes acquisition of the mineral estate of 440 acres of split-estate lands would be made from willing owners through purchase or exchange. The east boundary would follow the way through the split-estate section, then north along the 1.7-mile dead-end road to the northern boundary. The west boundary would be set back 300 feet from the .25-mile dead-end road to Crack in the Ground, then continue this setback south along the .75-mile way east of the crack to the section line forming the southern boundary(see Map 3).

Under this alternative, 3,500 acres would be recommended nonsuitable, including approximately 1,500 acres in the eastern portion where water is hauled daily for livestock during the grazing season. Approximately 2,000 acres at the south end of the WSA would also be recommended nonsuitable.

Energy and Mineral Development Actions

Wilderness designation under the proposed action would close 8,660 acres to all forms of mineral entry, plus an additional 440 acres if mineral estate is acquired for a total of 9,100 acres. This includes 110 acres with high potential for slab lava, 90 acres with moderate potential for slab lava, and 40 acres with high potential for cinders. One 10-acre cinder pit would be foregone. Forty acres of split-estate land with moderate potential for slab lava would be closed to mineral entry once the mineral estate is acquired, thus assuring no mineral development activity.

The remaining 3,500 acres that are recommended nonsuitable for wilderness would be open to energy and mineral entry. There are no mineral resources with moderate or high potential for occurrence in the nonsuitable portion.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations, including 2,000 to 3,000 wintering mule deer, in accordance with ODFW management goals and in a manner consistent with BLM's Wilderness Management Policy on the suitable portions of the WSA. Crucial winter range would be managed to produce sufficient forage for 2,000 to 3,000 wintering mule deer, within both the suitable and nonsuitable portions, by coordinating with livestock grazing allotment management. No wildlife projects are proposed for either the suitable or nonsuitable lands.

Livestock Management Actions

Livestock grazing use would continue at the current level of 623 AUMS within the WSA. Two miles of ways in the suitable portion would be closed to vehicle traffic. The gathering of cattle at the end of the use period would continue to be accomplished by horseback in both the suitable and nonsuitable portions. Maintenance of 1.5 miles of fence in the suitable portion would be accomplished by horseback or on foot.

Water hauling activities would occur along the boundary road in the northeast corner and watering would take place in the nonsuitable portion of the study area. About 6.5 miles of ways and 2 miles of road would remain open to vehicles for distributing livestock water, periodic checking of livestock, placing salt blocks, and other routine management activities. Vehicles, horses, or foot travel would be used to maintain the 4 miles of fence in the nonsuitable portion.

Wood Products Actions

Cutting of juniper for firewood would be prohibited on the 9,100 acres recommended suitable. Approximately 1,000 acres of juniper suitable for firewood cutting areas occur in this portion of the WSA.

Approximately 500 acres of harvestable juniper within the nonsuitable 3,500 acres would be available for designation as firewood cutting areas if demand warranted such an action. Current demand is met outside the WSA.

Recreation Management Actions

The 9,100 acres recommended suitable under the preferred alternative, including 2 miles of ways, would be closed to vehicle-oriented recreation.

The 3,500 acres recommended nonsuitable, including 6.5 miles of ways, would remain open to vehicle use. Current recreational use for the WSA is estimated to be approximately 3,500 visitor days per year, primarily associated with day-use at Crack in the Ground.

Partial

Under the partial alternative, 5,130 acres would be recommended suitable as wilderness and 7,470 acres would be recommended nonsuitable (see Map 4). In this alternative, the boundary would follow the physical edge of the lava flow, excluding all of the sagebrush/juniper lands that surround the flow. It would preserve the wilderness character of the lands within the lava flow. The mineral estate of 40 acres of split-estate lands within the area recommended suitable would be acquired through purchase or exchange, assuming that the owner is willing.

Energy and Mineral Development Actions

This alternative would close 5,130 acres to all forms of energy and mineral entry. Exploration would be unlikely on 110 acres with high potential and 90 acres with moderate potential for slab lava. No development of slab lava is projected because it is available elsewhere and the deposits in the WSA are difficult to reach and are not extensive. The area has 40 acres with high potential for cinders. One 10-acre cinder pit would be foregone. An additional 40 acres with moderate potential for slab lava would be closed if mineral estate of split-estate land is acquired, but development is not projected.

The 7,470 acres recommended nonsuitable for wilderness would be open to energy and mineral entry.

Wildlife Habitat Management Actions

Wildlife habitat for all species would be managed in accordance with ODFW's management goals, and in the suitable area, consistent with BLM's Wilderness Management Policy. Crucial winter range would be managed to produce sufficient forage for 2,000 to 3,000 wintering mule deer, within both the suitable and nonsuitable portions, by coordinating with livestock grazing allotment management. No wildlife projects are proposed for either the suitable or nonsuitable acreages.

Livestock Management Actions

Under this alternative, livestock grazing would continue at the current level of 623 AUMs. All 8.5 miles of ways would remain open for livestock management activities. Maintenance on 5.5 miles of fence would be accomplished using vehicles, horses, or foot travel.

Wood Products Harvest Actions

The approximately 1,000 acres of harvestable juniper at the northern end and approximately 500 acres of juniper at the southern end of the WSA are located in the nonsuitable portion and would be available for designation as firewood cutting areas. None of the harvestable juniper are within the suitable portion.

Recreation Management Actions

Under this alternative, 5,130 acres would be closed to vehicle traffic. The 7,470 acres recommended nonsuitable, including 8.5 miles of ways, would be open to vehicles. Current recreational use in the WSA is estimated to be approximately 3,500 visitor days per year, primarily associated with day use at Crack in the Ground.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire 12,600 acres of public land in the WSA would be open to energy and mineral exploration and development.

Exploration and development would likely not occur on 110 acres with high potential and 90 acres with moderate potential for slab lava due to inaccessibility of the sites.

Exploration and development would occur on 40 acres with high potential for cinders. Development would involve one borrow pit, with crushers and screens on site, and construction of about 1.5 miles of road, disturbing approximately 10 acres in the vicinity of the north cinder cone.

Wildlife Habitat Management Actions

Wildlife habitat would continue to be managed in accordance with ODFW goals for game and nongame wildlife species. Crucial winter range would be managed to produce sufficient forage for 2,000 to 3,000 wintering mule deer, within both the suitable and nonsuitable portions, by coordinating with livestock grazing allotment management. No wildlife projects are currently planned for the WSA.

Livestock Management Actions

Livestock grazing would remain at the current level of 623 AUMs. All 8.5 miles of ways within the study area would remain open to vehicles for livestock management activities. Maintenance on 5.5 miles of fence would be accomplished using vehicles, horses, or foot travel. No livestock projects are planned.

Wood Products Harvest Actions

The entire WSA would be open to the potential for designation of firewood cutting areas. Approximately 1,000 acres at the northern end of the WSA and approximately 500 acres at the its southern end contain harvestable juniper. Demand is currently met outside the WSA, however, areas within the 1,500 acres of harvestable juniper within the WSA could be designated for firewood cutting if demand warranted.

Recreation Management Actions

The entire 12,600 acres, including 8.5 miles of ways and the two dead-end roads, would remain open to vehicles. Current recreational use in the WSA is estimated to be approximately 3,500 visitor days per year, primarily associated with day-use at Crack in the Ground.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA has a very natural appearance. The lava flow portion of the area is extremely rugged and precludes most activities which would physically mark the area. The surrounding sagebrush/juniper lands also appear essentially natural.

Unnatural structural features in the WSA visually influence about 100 acres of the WSA. These features include 8.5 miles of vehicle ways which cannot be seen from either side of the routes due to vegetative cover. There are also 5.5 miles of fenceline which are well masked by vegetation and topography along their routes. The fences are not visible unless one is very close to the fence. There is a vault toilet near the Crack in the Ground, visually affecting approximately 5 acres. The .5 mile road into the Crack in the Ground and a road into the east side of the WSA used for water hauling impact a total of 3 acres and are not visible from outside the routes.

There are two seedings totaling 390 acres on the east side of the WSA. The seedings contain crested wheatgrass but have been invaded by sagebrush and rabbitbrush and appear to the average visitor similar to the surrounding native bunchgrass communities. Illegal juniper cutting has occurred in a few very localized areas within the WSA, leaving behind a few stumps and scarred trees.

Opportunities for Solitude and Primitive and Unconfined Recreation

Opportunities for solitude in the study area are outstanding. The extreme ruggedness of the lava flow isolates visitors within a very short distance. The sagebrush/juniper areas surrounding the flows generally offer more than adequate cover and topography to isolate the visitor. In portions immediately adjacent to the boundary road on the west side of the WSA and the vault toilet at the Crack in the Ground, opportunities for solitude are somewhat limited in comparison with the rest of the study area. Signs of human activity in the Christmas Valley area to the south, visible from the high points in the WSA, tend to emphasize the isolation within the WSA.

Day hiking opportunities are abundant in the entire WSA. Backpacking trips are available into the lava flow, along the lava edge and in the sagebrush/juniper areas. The flows are exceptionally rugged and offer limited camping sites. Camping sites are abundant on the periphery of the lava. Hunting occurs in the WSA as a primitive recreation activity not dependent on vehicle use.

Special Features

A variety of volcanic features offer scientific and educational opportunities, as well as opportunities for sightseeing and photography. The Crack in the Ground is a 2.5-mile-long tension crack in the basalt, a geologic feature not commonly available to the sightseer. Visitors can walk down into the Crack, which reaches a depth of 30 feet. Ferns, mosses, colorful lichens and lush grasses and shrubs grow in this narrow fissure. Two other tension cracks occur in the study area, one of which is 6 feet wide and reaches a depth of 38 feet.

The volcanic cones known as the Four Craters, which give the area its name, are highly scenic and colorful when viewed against the backdrop of the lava field and juniper cover surrounding them. Two of the cones are close enough to the boundary road for fairly easy access and they are popular hiking destinations. The farthest of these two cones exhibits ledges inside its crater, indicating that a lava lake may have existed at some time during past volcanic activity. The third cone is composed almost entirely of lava bombs. A fan-shaped lava flow nearby is an excellent example of aa lava. The WSA also contains kipukas—areas of undisturbed soils and native vegetation in the lava fields. In the vicinity of the fourth cone are spectacular lava spires formed as lava broke through the side of the cone and piled up in pressure ridges. The view from the cones is spectacular, overlooking the whole Christmas Valley area and the desert east to Wagontire Mountain.

The study area is located in crucial deer winter range. Winter populations of mule deer in the WSA range from 2,000 to 3,000 depending on climate and overall herd numbers. Several cultural resource lithic sites and historic sites are also located in the WSA.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler System of classifying ecosystems, the Four Craters WSA is located in the Intermountain Sagebrush Province with a potential natural vegetation of sagebrush steppe with juniper. The WSA is in a transition zone between the ponderosa pine forest to the north and the sagebrush steppe to the south. Vegetative communities listed in the High Lava Plains section of the Oregon Natural Heritage Plan which occur in the WSA are western juniper/Idaho fescue, western juniper/big sagebrush/bluebunch wheatgrass and big sagebrush/Idaho fescue.

The WSA is within 5 hours' driving time of four standard metropolitan statistical areas with populations over 100,000: Portland, Salem, Eugene/Springfield and Medford, Oregon.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and data provided by Engineer's International, Incorporated (EII), a consulting firm under contract with BLM. The EII data are in a report titled "Geological Investigation and Mineral Inventory of Devil's Garden, Four Craters, and Squaw Ridge in Lake County, Oregon." Also used in the evaluation were the results of a BLM geological/geochemical study and a recent report from the U.S. Bureau of Mines and the U.S. Geological Survey Bulletin 1738 A "Mineral Resources of the Devil's

Garden Lava Bed, Squaw Ridge Lava Bed, and Four Craters Lava Bed Wilderness Study areas, Lake County, Oregon" dated 1988.

The area has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 lists the mineral potential classifications for the WSA. Map 5 shows where energy or mineral resources have moderate or high potential for occurrence in the WSA.

The main feature of the WSA is the Quaternary Four Craters lava flow characterized by aa-type basaltic lava. A series of northwest trending cinder cones traverse the western half of the flow. The remaining portion of the WSA, outside of the Four Craters flow, is covered with Quaternary to Tertiary basalt flows. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depths of several thousands of feet.

Energy Resources

Geothermal energy is the potential energy resource in the area. Although no specific areas of geothermal potential have been identified in the WSA, the entire WSA is considered moderately favorable for the occurrence of geothermal resources, based upon recent volcanism and above-normal heat flow characteristics present throughout most of southeastern Oregon.

As of October 16, 1987, there were no leases for any energy resources.

Mineral Resources

Portions of the WSA are considered to be highly favorable and moderately favorable for the occurrence of slab lava. Demand for slab lava has dropped in recent years; inquiries to the Lakeview District BLM office regarding possible collection of slab lava have been at most two calls per year for the past 5 years. Slab lava occurring near the margins of the lava flow is considered exploitable to a minor degree; interior deposits are not readily accessible.

Four separate sites within the WSA, covering a total of 40 acres of the WSA, are rated as having a high potential for cinders. Two cinder deposits near the edge of the lava flow are accessible.

As of October 16, l987, there were no mining claims within the WSA.

Vegetation

The WSA consists mainly of western juniper/big sagebrush/bunchgrass communities. Wildfire plays a major role in the vegetative community of the WSA and the frequent fires on the lava generate more vegetative diversity, resulting in various transition stages in the vegetative composition. The rugged, irregular surface of the lava is vegetated to varying degrees by trees, grasses, shrubs, forbs, ferns and mosses. The ecological status of vegetative communities in the WSA varies from early seral in disturbed areas to potential natural community on portions of the flow.

Juniper is the dominant tree species in the WSA. Curl-leaf mountain mahogany, ponderosa pine and quaking aspen also occur within the study area. Shrubs consist of big sagebrush, bitterbrush, wax currant, Wood's rose, rabbitbrushes, snowberry, gland ocean-spray and desert sweet, which is an uncommon species restricted almost entirely to lava flows. Wildflowers include penstemons, cinquefoils, phacelias, hoary aster, groundsels, lupines and dwarf monkey-flower. Idaho fescue, bluebunch wheatgrass, Thurber's needlegrass, Indian ricegrass, bottlebrush squirreltail, Junegrass and bluegrasses also occur naturally. Two burns in the WSA were seeded about 12 years ago to crested wheatgrass. A 1986 wildfire in the southeastern portion of the WSA burned 1,360 acres in the WSA which are being allowed to revegetate naturally. There are no known threatened and endangered plant species within the WSA.

Wildlife

The WSA is part crucial winter range for the Devils Garden deer herd. Two to three thousand deer use the lava field for some or all of their wintering habitat; condition of the herd is good. A crested wheatgrass seeding in the northeast quarter of the WSA was a fire rehabilitation project to provide forage for this herd, and was partially financed by the ODFW because of the crucial habitat involved.

The WSA is within the range of northern bald eagle, which is Federally-listed as threatened in Oregon. The WSA does not provide significant bald eagle habitat or range, and only casual sightings have been reported for the WSA. No documented sightings or nesting has occurred.

Other birds in the WSA include great horned owl, mourning doves, quail, common flickers, red-tailed and rough-legged hawks, prairie falcon and American kestrel. Mountain bluebird, Townsend's solitaire, robins and many passerine species frequent the area.

Coyotes, bobcats, marmots, black-tailed jackrabbits, cottontails, golden-mantled ground squirrel, least and yellow pine chipmunks, kangaroo rats, jumping mice, bats and various species of snakes and lizards are also found in the WSA. Occasional cougar sightings have been reported.

Watershed

There are no perennial streams or springs in the WSA.

Livestock Grazing

Portions of two livestock grazing allotments are within the WSA. Table 4 shows the existing livestock allocation and season of use. Existing livestock projects in the WSA include 5.5 miles of fence.

Grazing operators currently use vehicles for daily watering of stock in the Crack in the Ground allotment, for periodic stock watering in the East Green Mountain allotment and for various range work such as salting during the use period on both allotments. Livestock are gathered by horseback at the end of the use period. Some vandalism to stock and stock developments has occurred in the vicinity of the WSA.

Wood Products Harvest

Approximately 1,500 acres in the WSA contain juniper suitable for firewood. No firewood cutting areas have been established within the study area, but some illegal removal of trees has occurred in the past. Demand for legitimate sources of firewood is currently met from designated areas outside the WSA.

Recreation Use

The Crack in the Ground, with approximately 2,500 visitor days per year of recreational use, is probably receiving more recreation use than any other site in the Christmas Valley area. The Crack is accessible by road; most visitors drive to the edge of The Crack and then walk down into the fissure for approximately the first half mile.

Recreation use on the lava flows is high at the northern two cinder cones. A considerable number of people hike the cones each year, judging from the trails that have been established. The southern part of the WSA is used by hunters in vehicles who cross on ways and cross-country, as well as on foot. Hunting and hiking use is estimated to be approximately 1,000 visitor days per year.

There is no vehicle recreation in the lava flow area due to the extremely rugged terrain. The east and south sides of the WSA are more accessible to vehicles. Population in the Christmas Valley area of north Lake County grew 70 percent from 1970-1980, and recreation use on all of the surrounding desert has been increasing, particularly with respect to Off Road and All-Terrain Vehicles (ORV/ATV).

Although a recent moratorium on water use for agriculture may lead to a leveling of population in the Christmas Valley area in the near future, Portland State University studies indicate populations of the Bend/Redmond/La Pine areas are still increasing. Recreation users from this area use the desert around Christmas Valley extensively. The PSU study indicates a doubling of the population by the year 2000, although local respondents regard this projection as slightly high.

As a result of recent population trends in Christmas Valley and the Bend/Richmond/La Pine area, recreation use in the WSA is increasing at about 50 visitor days per year. Most of the increase is occurring at Crack in the Ground.

Local Personal Income

Livestock use at the current level of 623 AUMs and recreation use totaling 3,500 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local person income generated annually from these existing use levels amounts to approximately $7,476 for livestock grazing and $42,000 related to recreation use, for an overall total of $49,476. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives for this WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 12,600 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The all wilderness alternative would add all 12,600 acres to the National Wilderness Preservation System. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features, including the various volcanic features, the crucial deer winter range, the undisturbed soils and native vegetation of the kipukas, and the cultural sites would also be protected.

Naturalness

The naturalness of the area's rugged lava flow and associated cinder cones and tension cracks would be preserved by the preclusion of cinder and slab lava removal. The closure of 8.5 miles of ways, which visually affect approximately 100 acres, would enhance the naturalness of the surrounding sagebrush/grassland by allowing for their revegetation.

Complete revegetation on 7.5 miles of way would eliminate naturalness impacts on 90 of the 100 affected acres. Sufficient growth to obscure these tracks would probably occur within three to five years, while the 1-mile of way used for daily water hauling in the eastern portion of the WSA would persist as long as the water hauling continues.

The 1.7-mile dead-end road in the northeastern portion and the .25-mile dead-end road to the Crack in the Ground would remain open and would continue to affect naturalness in their immediate vicinities. Enforcement of wilderness protection stipulations would also preserve the naturalness of the WSA by eliminating the illegal cutting of juniper.

Solitude

Opportunities for solitude provided by the complex terrain of the lava flow and the juniper groves peripheral to the flow on the north, east and south would be further improved by the elimination of vehicle traffic from 8.5 miles of ways in the lava-free portion of the WSA. Periods of water hauling in the eastern portion of the WSA would reduce opportunities for solitude when livestock are present in the Crack in the Ground and East Green Mountain allotments. The preclusion of cinder and slab lava removal and of firewood cutting would enhance opportunities for solitude by ensuring that the noise and vehicle use associated with these activities would not occur in the WSA.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be enhanced under this alternative by eliminating vehicle access to the lava-free areas in the WSA where the prime camping spots are located. Enjoyment of the scenic features of the area would be ensured by prohibiting the removal of cinders and slab lava which are an integral part of the lava flow dominating the WSA. Preservation of existing vegetation, including juniper groves, would continue natural processes which support wildlife and provide hunting, photographic, sightseeing and nature study opportunities in a primitive setting.

Water hauling activities in the eastern portion of the WSA would locally impair opportunities for primitive and unconfined recreation when livestock utilize the Crack in the Ground and East Green Mountain allotments.

Special Features

The protection provided by wilderness designation under this alternative would preserve habitat for a variety of wildlife species (including crucial mule deer winter range), native plant communities in kipukas, and the scientific and educational values of the Crack in the Ground, the cinder cones, the lava spires and other volcanic features. The closure of 8.5 miles of vehicle ways would reduce the likelihood of illegal wood cutting and artifact collection from cultural resource sites within the WSA.

Conclusion: Wilderness qualities would be preserved and enhanced.

Impacts on Energy and Mineral Development

Wilderness designation would close 11,960 acres to mineral entry, while 640 acres of split-estate would remain open to mineral exploration and development at the owner's discretion.

Energy Developement

Exploration and development for energy resources would be prohibited on 11,960 acres. The 640 acre split-estate parcel would be open to energy entry. Exploration and development are not projected in the WSA due to a lack of direct evidence for the occurrence of oil and gas and the present lack of interest in geothermal development in this area.

Conclusion: No impact to energy development is expected.

Mineral Development

The 110 acres with high potential and 90 acres with moderate potential for slab lava plus 40 acres with high potential for cinders would be closed to mineral entry. Development of one 10-acre cinder pit would be foregone.

Conclusion: Under the all wilderness alternative, development of one 10-acre cinder pit would be foregone.

Impacts on Vegetation

Vegetative composition as described under Vegetation in the Affected Environment section would not be changed under this alternative. Ecological status, which ranges from early seral to potential natural community, would not be affected by outside manipulation or intentional introduction of non-native species. The communities in early and mid-seral stages would be expected to trend toward potential natural community. Vegetation at late seral and potential natural community would be unchanged.

Seven-and-one-half miles of ways would revegetate in approximately three to five years. One mile of way impacted by livestock water hauling would not revegetate.

Conclusion: Of the 8.5 miles of ways in the WSA, 7.5 would revegetate. Little or no change would occur to vegetation in the rest of the area.

Impacts on Wildlife

Wildlife habitat for all species and the natural ecological balance would be maintained throughout the WSA under the all wilderness alternative. Crucial winter range for 2,000 to 3,000 mule deer would be preserved or enhanced on 12,000 acres.

Conclusion: Wildlife habitat and population levels would be maintained.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of 623 AUMs in the WSA. Vehicle use on 1 mile of way would be limited to the daily trips necessary to haul water during the season of use for each of the two allotments within the WSA. Two miles of road would be available for water hauling or other livestock management actions. All other livestock management actions, including maintenance of 5.5 miles of fence, would be conducted by horseback or on foot.

Conclusion: The all wilderness alternative would limit vehicle use for livestock management on 7.5 miles of ways causing a minor inconvenience to the livestock operators. Most livestock uses would not change.

Impact on Wood Products Harvest

Approximately 1,500 acres containing juniper suitable for firewood would be closed to collecting. Demand would be met outside the WSA.

Conclusion: Juniper harvest would be foregone on 1,500 acres.

Impacts on Recreation Use

The all wilderness alternative would close 8.5 miles of ways to motorized vehicles. Access to the picnic area and vault toilet at the Crack in the Ground would remain open. The way east of Crack in the Ground would be closed to vehicles, but this closure is not expected to decrease recreational use of the area.

The east side of the WSA currently receives very little vehicle recreation use other than hunting. There would be a reduction of less than 50 visitor days per year associated with vehicle dependent hunting in the south and east portions of the WSA. On the north end of the area, the distances from the boundary to the lava flow are short and no impact on hunting is expected.

Recreation use would be expected to increase slightly, approximately 50 visitor days per year, due to regional population growth and dispersed use. Most of the increased use would center around Crack in the Ground.

Conclusion: Population growth would be expected to produce an increase of about 50 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 623 AUMs and income generated from this activity would remain unchanged. Recreation use levels are expected to increase with population growth by 50 visitor days per year, resulting in an increase in local personal income of approximately $600 annually. The overall effect would be an annual increase from $49,000 to $49,600, as shown in Table 5.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $600.

Proposed Action

Recommended suitable for wilderness: 9,100 acres (assuming acquisition of 440 acres of split-estate lands)
Recommended nonsuitable for wilderness: 3,500 acres

Impacts on Wilderness Values

Under this alternative, 9,100 acres would be designated wilderness. Wilderness values in this portion of the WSA would be protected by legislative mandate. In addition, it is assumed that the mineral estate on 440 acres of split-estate land would be acquired from willing owners.

Wilderness values on the 3,500 acres nonsuitable would not receive legislative protection and would be subject to the effects of continued vehicle use for recreation and management of livestock and resource utilization such as juniper harvest.

Naturalness

Under the proposed action, naturalness would be enhanced on the lava-free portions of the WSA by the elimination of motorized vehicle use along 2 miles of ways. Acquisition of the mineral estate on 440 acres of split-estate land would enhance naturalness by ensuring slab lava development activities do not occur on 40 acres. Two miles of road and the 6.5 miles of ways would be outside the suitable area.

In the 3,500 acres nonsuitable for wilderness, naturalness would be degraded by projected increases in vehicle use on 6.5 miles of ways and by off-road vehicle activity, visually affecting approximately 80 acres.

Solitude

Solitude would be enhanced on the south portion of the 9,100 acres recommended suitable by the elimination of motorized vehicles. The exclusion of off-road vehicle use in the sagebrush/grassland areas peripheral to the lava flow would enhance solitude by reducing the sight and sound of vehicles. Acquisition of the mineral estate on 440 acres of split-estate land would also enhance opportunities for solitude by precluding mineral development on approximately 40 acres rated moderate for slab lava.

Opportunities for solitude within the 3,500 acres recommended nonsuitable would continue to be impaired by continued and increasing motor vehicle use on 6.5 miles of ways and 2 miles of roads.

Primitive and Unconfined Recreation

Within the 9,100 acres recommended suitable, opportunities for primitive and unconfined recreation would be preserved within the lava flow and enhanced on the lava-free areas by the elimination of motorized vehicles on 2 miles of ways.

Within the 3,500 acres recommended nonsuitable, these same opportunities would continue to be increasingly impacted by vehicle-oriented recreation, especially near Crack in the Ground.

Special Features

Cinder cones, lava spires, tension cracks and other volcanic features within the 9,100 acres recommended suitable, as well as vegetative diversity, crucial mule deer winter range and cultural resources would be preserved and enhanced under wilderness designation.

In the area recommended nonsuitable, the Crack in the Ground, a unique topographic and geologic feature, would receive most of the projected increase of 50 visitor days per year of recreation use.

Conclusion: Wilderness designation of 9,100 acres would protect and enhance existing wilderness values. Within the 3,500 acres nonsuitable for wilderness, the continuance of non-wilderness management practices and increased recreation use would produce cumulative impacts which would reduce or eliminate wilderness values.

Impacts on Energy and Mineral Development

This alternative would withdraw 8,660 acres from mineral entry, and assumes an additional 440 acres of mineral estate of the split-estate lands would be acquired. In the area recommended nonsuitable, 3,500 acres would be open to mineral entry.

Energy Development

Exploration and development of energy resources would be foregone on 9,100 acres. Due to the limited indirect evidence of geothermal potential, extremely rough terrain, and the lack of interest in developing energy resources in this area, no exploration or development is projected on lands either suitable or nonsuitable under this recommendation.

Conclusion: No impact to energy development is expected.

Mineral Development

The 9,100 acres recommended suitable would be closed to mineral entry, including the 40 acres with high potential for cinders. Development of one 10-acre cinder pit would be foregone. No mineral development is expected on the 3,500 acres recommended nonsuitable due to lack of evidence for occurrence of mineral resources.

Conclusion: Development of one 10-acre cinder pit would be foregone.

Impacts on Vegetation

Vegetation would be preserved in the existing condition on the 9,100 acres recommended suitable, and early and mid-seral communities would be allowed to progress toward potential natural community according to natural processes. Utilization of forage species would remain at the current level with a corresponding maintenance of residual ground cover.

On the 3,500 acres recommended nonsuitable, vegetation would continue to be impacted by vehicle use on 6.5 miles of ways by preventing the reestablishment of vegetation in the tracks, which visually affect approximately 80 acres. Increasing off-road vehicle use would further impact vegetation. The possibility of designating firewood cutting areas in the 500 acres of juniper in this nonsuitable portion also would potentially impact existing vegetation by removal of individual trees.

Conclusion: Vegetation would be preserved on 9,100 acres. Juniper cutting on the nonsuitable portion would alter vegetation on approximately 500 acres.

Impacts on Wildlife

Wildlife habitat for all species will be preserved and protected in the portion recommended suitable for wilderness, including crucial mule deer winter range. The total winter range within the WSA supports between 2,000 and 3,000 deer.

Within the portion recommended nonsuitable, no developments or vegetative manipulations for wildlife are proposed. Crucial deer winter range including adequate forage, will be maintained in accordance with ODFW goals, although some disturbance by vehicles is possible.

Conclusion: No measurable impacts to wildlife are expected under this alternative.

Impacts on Livestock Grazing

Livestock grazing within the WSA would remain at the current level of 623 AUMs within the WSA. Livestock management activities using vehicles would be precluded on 2 miles of ways, resulting in minor inconvenience to operators. No livestock projects are proposed for the WSA.

The 6.5 miles of ways and 2 miles of road in the nonsuitable portion would be open to vehicle use for livestock management.

Conclusion: Closure of 2 miles of ways would result in a minor inconvenience to livestock operators.

Impacts on Wood Products Harvest

No wood cutting would be permitted on the 9,100 acres recommended suitable, precluding the designation of firewood cutting areas within the 1,000 acres of harvestable juniper. Approximately 500 acres of harvestable juniper in the nonsuitable portion would be available for designation of firewood cutting areas, should demand warrant such action.

Conclusion: Juniper harvest would be precluded on 1,000 acres.

Impacts on Recreation Use

Vehicle-oriented recreation would be precluded on 2 miles of ways. No measurable change in recreation use is anticipated from this closure. Regional population growth projected in PSU studies would bring about nearly all of the expected increase of about 50 visitor days per year in the WSA. Most of the use would center around Crack in the Ground.

Primitive recreation opportunities would be reduced slightly on the nonsuitable portion with unrestricted vehicle use disturbing the primitive setting for such activities as tent camping, nature study, hunting, photography and birdwatching.

Conclusion: Population growth would be expected to produce a projected increase of about 50 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 623 AUMs. Recreation use is expected to increase by 50 visitor days per year due to population growth. The effect on local personal income would be an increase of $600 annually based on the recreation use increase. Table 5 shows the effects on local personal income generated from these activities.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by $600.

Partial

Recommended suitable for wilderness: 5,130 acres (assuming acquisition of 40 acres of split-estate lands)
Recommended nonsuitable for wilderness: 7,470 acres

Impacts on Wilderness Values

The partial alternative would add 5,130 acres to the NWPS, and wilderness values in this lava-covered portion of the WSA would be protected by legislative mandate. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and special features, would be retained and protected on these 5,130 acres. Acquisition of 40 acres of mineral estate on split-estate land would protect these lands from slab lava removal.

Wilderness values on the remaining 7,470 acres would not receive special legislative protection and would be subjected to the effects of continued vehicle use on 8.5 miles of ways and of increasing off-road vehicle use.

Naturalness

The 5,130 acres recommended suitable under this alternative would be protected in their present natural condition. Cinder removal would not be allowed, thus preserving the natural features of the lava flow and associated vegetation. Acquisition of the mineral estate on 40 acres of split-estate land would enhance naturalness by ensuring slab lava development activities do not occur. Two miles of road and the 6.5 miles of ways would be outside the suitable area.

The lava-free areas of the WSA, all of which are recommended nonsuitable under this alternative, would be subject to continued and increasing motorized vehicle use which would impact the naturalness of these 7,470 acres. Revegetation of 8.5 miles of ways, which visually affect approximately 100 acres, would be prevented and new ways would be established. Grasses, forbs and shrubs would be damaged by off-road use, particularly in the area around the Crack in the Ground where the majority of vehicle-oriented activity is concentrated. Approximately 1,500 acres containing harvestable juniper would be available for designation as firewood cutting areas, allowing removal of natural tree cover.

Solitude

Opportunities for solitude would be preserved in the suitable portion, and enhanced if the 40 acres of mineral estate are acquired. This acquisition would preclude the removal of slab lava and the associated presence of vehicles, which would locally reduce opportunities for solitude.

Opportunities for solitude in the nonsuitable portion would continue to be impacted by vehicle access to 7,470 acres, including 8.5 miles of ways, visually affecting about 100 acres. The visual impact of vehicles on and off-road, and the associated noise, would mainly diminish opportunities for solitude in the vicinity of the Crack in the Ground.

Primitive and Unconfined Recreation

Primitive recreation potential within the 5,130-acre lava field would be preserved. The potential for slab lava and cinder removal would be eliminated, thereby preserving the natural features and the primitive environment which provide opportunities to study volcanism, plant succession and ecological interactions.

Primitive recreation activities such as hiking and camping would be constrained as the most favorable primitive camping areas lie outside the lava flow where increased vehicle activity would reduce the potential for a primitive recreation experience. The primitive setting for hunting, sightseeing, photographic and nature study opportunities would be reduced by vehicle use on the 8.5 miles of ways visually affecting approximately 100 acres.

Special Features

The special volcanic features of the lava flow, including cinder cones, lava spires and pressure ridges would be preserved under this alternative, as would the natural ecological interrelationships within the lava flow and associated kipukas.

The Crack in the Ground would not receive special wilderness protection under this alternative, nor would crucial deer winter range peripheral to the lava flow. Vehicle activity in this area would cause disturbances to wintering deer. Cultural resources would be more susceptible to disturbance due to ease of access offered by vehicle travel in the area.

Conclusion: The partial alternative would protect wilderness values on 5,130 acres and prohibit cinder removal from the north cinder cone.

On the 7,470 acres nonsuitable, areas outside of the lava flow would receive increased vehicle use which would impair naturalness and affect special features including crucial deer winter range and cultural resources. Opportunities for solitude and primitive types of recreation would be reduced in the nonsuitable portion over time.

Impacts on Mineral and Energy Development

Under this alternative, wilderness designation would close 5,130 acres to mineral entry, assuming 40 acres of mineral estate of split-estate land is acquired. The 7,470 acres recommended nonsuitable would be open to mineral entry.

Energy Development

Due to a lack of direct evidence of occurrence, difficult access to potential energy resources, and a lack of interest in development of energy reserves in this area, no exploration or development of the moderate potential geothermal resources is projected.

Conclusion: No impact to energy development is expected.

Mineral Development

The 5,130 acres recommended suitable would be closed to mineral entry. The opportunity to develop one 10-acre cinder pit would be foregone.

Conclusion: Development of one 10-acre cinder pit would be foregone.

Impacts on Vegetation

The natural vegetation occurring on the lava flows and in kipukas would be preserved on 5,130 acres.

Vegetation outside of the lava flow would be subject to alteration by increased vehicle use on 8.5 miles of ways and off existing roads and trails within the 7,470 acres recommended nonsuitable. Junipers and surrounding vegetation would be removed or disturbed on 1,500 acres containing juniper trees, if made available for harvest.

Conclusion: Vegetation within the lava flow would be preserved on 5,130 acres. Vegetation in the nonsuitable portion would be altered on approximately 1,500 acres within the 7,470 acres recommended nonsuitable.

Impacts on Wildlife

Wildlife habitat including crucial deer winter range within the 5,130 acre lava flow recommended suitable would be managed to support existing wildlife populations in accordance with ODFW goals and BLM's Wilderness Management Policy.

Wildlife habitat on the 7,470 acres nonsuitable would be managed to meet ODFW goals and provide adequate forage. However, these lands would be subject to increased vehicle impacts during use by 2,000 to 3,000 deer on crucial winter range. Removal of juniper cover would cause a minor reduction in thermal cover and short-term impacts to forage species.

Conclusion: Wildlife habitat would be preserved within the lava flow. Habitat in the nonsuitable portion, including crucial mule deer winter range, would not receive the added protection afforded by wilderness designation.

Impacts on Livestock Grazing

Due to the rugged nature of the lava flow, no livestock grazing occurs in this portion of the WSA which is recommended suitable under this alternative.

Grazing would continue at existing levels of 623 AUMs in the nonsuitable portion. Water hauling, fence maintenance, gathering, and other livestock management actions would continue as at present.

Conclusion: There would be no impact to livestock grazing.

Impacts on Wood Products Harvest

Juniper harvest for firewood using cross-country access ways would occur within the 1,500 acres, of the 7,470 acres nonsuitable, which support harvestable trees. Demand for firewood to date has been accommodated outside the WSA.

Conclusion: There would be no impact to wood products harvest.

Impacts on Recreation Use

No ways would be closed within the WSA, therefore there would be no impacts to vehicle-oriented recreation. Based on population growth projected in the region, primitive recreation use would be expected to increase slightly over time within the area designated wilderness.

Vehicle-oriented recreation in the nonsuitable portion is expected to increase. Regional population growth projected in PSU studies would bring about increases in recreation use of about 50 visitor days per year in the WSA. Most of the use would center around Crack in the Ground.

Primitive recreation opportunities would be diminished on the nonsuitable peripheral sagebrush/grassland areas by continued vehicle use, which would increase slightly and would include cross-country use as well as some expansion of ways over time. This off-road vehicle use on the nonsuitable 7,470 acres would further degrade such primitive recreation opportunities as hunting, hiking, photography, sightseeing and nature study.

Conclusion: Wilderness designation would produce a slight increase in recreation use, but population growth would be expected to produce most of a projected increase of about 50 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 623 AUMs, resulting in no change in annual local personal income. An increase of $600 per year is expected to result from population growth in the area and therefore an increase in recreation use. This increase is expected to be 50 visitor days per year. Table 5 shows the effects on local personal income generated from these activities.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by $600.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 12,600 acres

Impacts on Wilderness Values

Under the no wilderness alternative, the entire 12,600 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Naturalness, solitude, primitive and unconfined recreation, and the area's special features, including the Crack in the Ground and other volcanic features, cultural resources, and undisturbed soils would be subject to the effects of projected management actions. Projected management actions include the development of one cinder pit, continued vehicle access on 8.5 miles of ways and an open ORV designation.

Naturalness

The cinder pit projected for the northernmost cinder cone would permanently change the shape of the cinder cone and alter the naturalness of 10 acres, and indirectly affect about 80 acres. Firewood cutting in juniper stands, covering 1,500 acres, would visually impact the portions of the WSA's naturalness.

Continued vehicle use of 8.5 miles of ways and increased cross-country vehicle use would result in the persistence of existing ways, development of new tracks, damage to vegetation, and disturbance of soils. The existing ways would continue to be visible, affecting approximately 100 acres.

Solitude

Opportunities for solitude would be reduced by such activities as projected cinder removal and increased vehicle use of the lava-free areas of the WSA. Increased vehicle use would be most evident in the vicinity of Crack in the Ground.

Primitive and Unconfined Recreation

The no wilderness alternative would impact opportunities for primitive and unconfined recreation by allowing continuation of vehicle access on 8.5 miles of ways and by allowing increased off-road vehicle use. Projected cinder removal would affect such primitive recreation activities as sightseeing, photography and the study of volcanism. There would be a substantial impact on the scenic value of the popular north cinder cone if cinder removal is allowed.

Special Features

Special features of the WSA, particularly the cinder cones, other volcanic features, and their associated vegetation, could be degraded by mining activities. Crucial deer winter range would be subject to increased vehicle use and disturbance of wildlife.

Conclusion: Wilderness values would be lost on approximately 1,500 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

No acreage would be withdrawn from mineral entry under the no wilderness alternative.

Energy Development

The entire 12,600 acres would be open to energy exploration and development. Due to a lack of direct evidence of occurrence, difficulty to access potential energy resources, and a lack of interest in geothermal development in this area at this time, no exploration or development is expected for geothermal resources. There is no evidence for the occurrence of oil and gas within the WSA.

Conclusion: No impact on energy development would occur.

Mineral Development

All 12,600 acres would be open to mineral entry. Projected development of one borrow pit for cinders would be realized. This development would directly impact 10 acres with indirect influence on approximately 80 acres.

Conclusion: Development of one 10-acre cinder pit would occur.

Impacts on Vegetation

Continued vehicle use of 8.5 miles of ways and increasing off-road vehicle use in the lava-free portions of the WSA would crush vegetation, particularly in the vicinity of Crack in the Ground where vehicle-oriented recreation use is concentrated and increasing. Mining activities on the north cinder pit would destroy vegetation on approximately 10 acres. Permits for the harvest of juniper for firewood could be issued, impacting vegetation by the removal of selected trees from scattered stands of juniper totaling 1,500 acres.

Conclusion: Vegetation would be altered on approximately 1,500 acres.

Impacts on Wildlife

Crucial deer winter range would continue to be managed in accordance with ODFW goals and to produce adequate forage for 2,000 to 3,000 deer. The added protection to wildlife habitat afforded by the closure of ways to vehicle access would be foregone. The cutting of firewood on approximately 1,500 acres would impact wildlife habitat by removal of trees which provide nesting places for birds and shade and cover for mule deer and other wildlife species. Activities associated with removal of cinders would have a local and short-term impact on wildlife habitat due to vehicle presence and surface disturbance at the cinder cone.

Conclusion: Wildlife habitat could be degraded on approximately 1,500 acres.

Impacts on Livestock Grazing

Livestock grazing would continue at the current level of 623 AUMs within the two allotments in the WSA. The 8.5 miles of ways would remain open to livestock management activities, and water hauling and fence maintenance would continue as at present.

Conclusion: No change in livestock grazing would occur.

Impacts on Wood Products Harvest

The entire 12,600 acres would be open to wood products harvest. Approximately 1,500 acres of juniper would be available for harvest.

Conclusion: Juniper harvest would occur on 1,500 acres.

Impacts on Recreation Use

Alteration of the shape of cinder cones by cinder removal would impact the scenic qualities of the north end of the WSA. The removal of juniper would impact the natural appearance of the juniper groves, reducing opportunities for primitive types of recreation such as photography and nature study.

The entire 12,600 acres, including 8.5 miles of ways, would be open to vehicle access. Approximately 5,130 of these acres are unsuitable for off-road travel due to the ruggedness of the terrain. Vehicle-oriented recreation would be expected to increase, mainly in the vicinity of Crack in the Ground, by about 50 visitor days per year due to regional population increases.

Conclusion: Approximately 7,470 acres would be open and available to vehicle-oriented recreation. An increase of about 50 visitor days would occur as a result of regional population increases.

Impacts on Local Personal Income

Livestock grazing would remain at 623 AUMs. Development of a cinder pit would increase local personal income by an unknown amount. Recreation use is expected to increase by 50 visitor days per year based on population projections. This would result in an increase of $600 in local personal income annually.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $600 per year, plus an unknown amount from mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by at least $600.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action, continued vehicle use and harvest of junipers would degrade wilderness values on approximately 1,500 acres, with indirect visual impacts affecting a larger area. The extent of the visual impacts would depend upon the precise areas of tree removal.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action the existing livestock management regime would continue, as would juniper harvest and recreational vehicle access. Long term protection of wilderness values would be foregone on 3,500 acres, 1,500 of which would be directly impacted by short-term use relative to juniper harvest. An additional acreage of unknown size would be visually affected by tree removal. The long-term productivity of wilderness values would be preserved on 9,100 acres.

Irreversible and Irretrievable Commitments of Resources

The proposed action does not represent irreversible or irretrievable commitments of resources. Juniper harvest would cause a short-term loss of wilderness values but the vegetation change would not be irretrievably committed.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The Four Craters WSA would be manageable as wilderness under all alternatives. Livestock management activities on the southern portion of the WSA would complicate wilderness management under the all wilderness alternative. The irregular land ownership pattern on the east side of the WSA could cause some management problems along the boundary.

The area is capable of being managed to preserve its wilderness characteristics under the Proposed Action. Acquisition of 440 acres of mineral estate of split-estate lands would enhance manageability by precluding mining activities which would impair wilderness values. Management under the Proposed Action would be enhanced by defining the northeastern boundary at the dead-end road rather than along irregular private land ownership lines.

Rationale for Selection of the Proposed Action

The Proposed Action would resolve manageability problems caused by livestock water hauling by recommending as nonsuitable that portion of the WSA in which water is hauled. This alternative also recommends acquiring the mineral estate of the split-estate land on the east side of the area and would use a way as a boundary, therefore further simplifying management.

This alternative would recommend as suitable the area containing the most wilderness values while recommending as nonsuitable lands where continued grazing practices and vehicle use would conflict with wilderness values and management.

The benefits of preserving wilderness values in the portion recommended as suitable for wilderness would outweigh the benefits of leaving the area open for development of potential mineral or other resources.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: The demand for slab lava is overrated. **Response:** Slab lava was not considered a significant enough issue in this WSA to affect the recommendation. This comment is also addressed in the text.

Comment: Abundant ground water was not adequately addressed. **Response:** The Engineer's International report for the three lava flows in the Christmas Valley area indicates that the ground water for the Four Craters lava flow is no higher than for the rest of the area. Wells nearby do not exhibit flows that would indicate a particularly abundant supply of ground water for the WSA.

Comment: The diverse vegetation on the lava flow needs more attention. **Response:** Additional information has been added to the Vegetation section under Affected Environment.

Comment: Crested wheatgrass seedings are not as beneficial to wildlife as native vegetation. **Response:** The nutritional value of crested wheatgrass during the late fall and winter (when deer use this WSA) is superior to the nutritional value of any native bunchgrass, with the possible exception of Sandberg's bluegrass. The value of crested wheatgrass seedings did not affect evaluation of the alternatives.

Comment: Impacts of development on deer herds is not adequately addressed. **Response:** In spite of expanded agricultural activities in the Christmas Valley area, the deer herd which uses the Four Craters WSA is on the increase and remains in good health.

Comment: Agricultural developments have increased pronghorn use near lavas. **Response:** Pronghorn have been drawn into the Christmas Valley area by the planting of alfalfa fields. These animals seem to prefer the fields to the sagebrush areas surrounding this lava flow.

Table 1. Summary of Proposed Management Under Each Alternative, Four Craters Lava Bed WSA (0R-1-22)

Proposed Management	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	12,600	9,100	5,130	0
Acres Closed to ORVs by Wilderness Designation	12,600	9,100	5,130	0
Miles of Ways Closed	8.5	2	0	0
Miles of Roads Constructed	0	0	0	1.5
Acres of Mineral Estate Acquired[1]	0	440	40	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	11,960	8,660	5,090	0
Number of Cinder Mines Developed	0	0	0	1
Acres of Suitable Minor Forest Products Available for Harvest	0	500	1,500	1,500

[1] Upon acquisition of mineral estate, these lands would be withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Four Craters Lava Bed WSA (OR-1-22)

Resource or Activity	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/No Action
Wilderness Values	Wilderness designation of 12,600 acres would protect or enhance existing values.	Wilderness designation of 9,100 acres would protect or enhance existing values. Loss or impaired values on 3,500 acres due to indirect impacts.	Wilderness designation of 5,130 acres would protect or enhance existing values. Loss or impaired values on 7,470 acres to indirect impacts.	Wilderness values lost on 1,500 acres due to development actions. Loss or impairment on 12,600 acres to indirect impacts.
Energy and Mineral Development	One cinder pit foregone	One cinder pit foregone	One cinder pit foregone	One cinder pit developed
Vegetation	Vegetation preserved on 12,600 acres. 7.5 miles of ways would revegetate.	Little or no change to existing vegetation. Juniper removed on 500 acres.	Little or no change to existing vegetation. Juniper removed on 1,500 acres.	Juniper removed on 1,500 acres.
Wildlife	Habitat and populations for all species, including crucial deer winter range, preserved.	Minimal impact to habitat due to possible wood cutting on 500 acres.	Habitat disturbed on 1,500 acres	Habitat disturbed on 1,500 acres
Livestock Management	No change in use. 7.5 miles of way closed to routine management activities.	No change in use. 2 miles of way closed.	No impact	No impact
Wood Products	Juniper harvest precluded on 1,500 acres.	Juniper harvest precluded on 1,000 acres.	No impact.	No impact.
Recreation Use	8.5 miles of way closed. Increase of 50 visitor days due to population growth.	2 miles of way closed. Increase of 50 visitor days due to population growth.	Increase of 50 visitor days due to population growth.	Increase of 50 visitor days due to population growth.
Local Personal Income	Local personal income generated from resource outputs in the WSA would increase by $600	Local personal income generated from resource outputs in the WSA would increase by $600 per year.	Local personal income generated from resource outputs in the WSA would increase by $600 per year.	Local personal income generated from resource outputs in the WSA would increase by $600 per year.

Table 3. Classification of Energy and Mineral Potential, Four Craters Lava Bed WSA (OR-1-22)

Commodity	Area	Level of Potential	Level of Certainty
Metals (gold,silver,mercury)	Entire WSA	L	B
Geothermal	Entire WS	M	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	0	C
Bentonite	Entire WSA	0	B
Diatomite	Entire WSA	L	B
Zeolites	Entire WSA	0	B
Slab lava	See Map 5	H	D
	See Map 5	M	D
	Rest of WSA	L	C
Cinders	See Map 5	H	D
	Rest of WSA	0	C

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

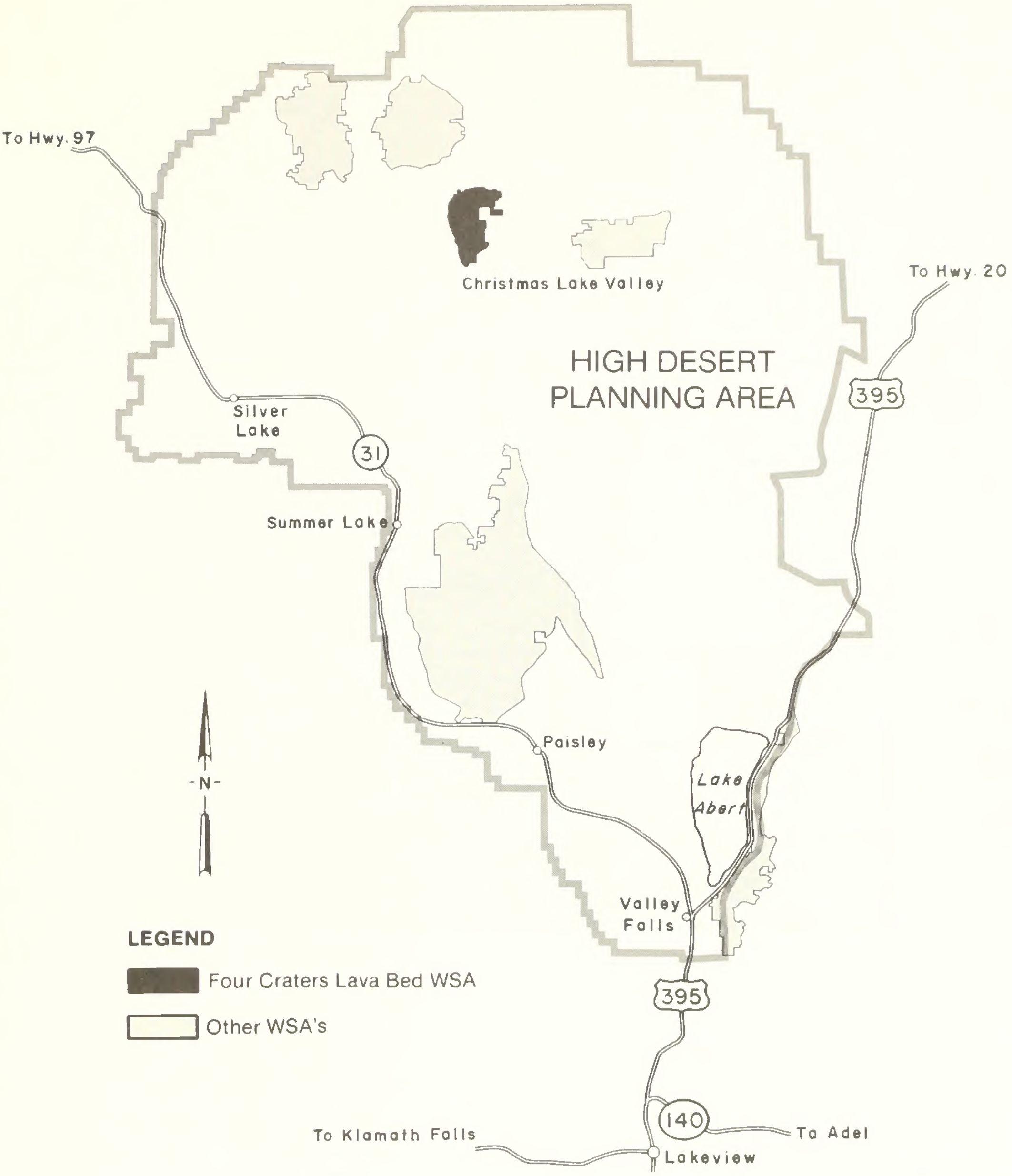
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

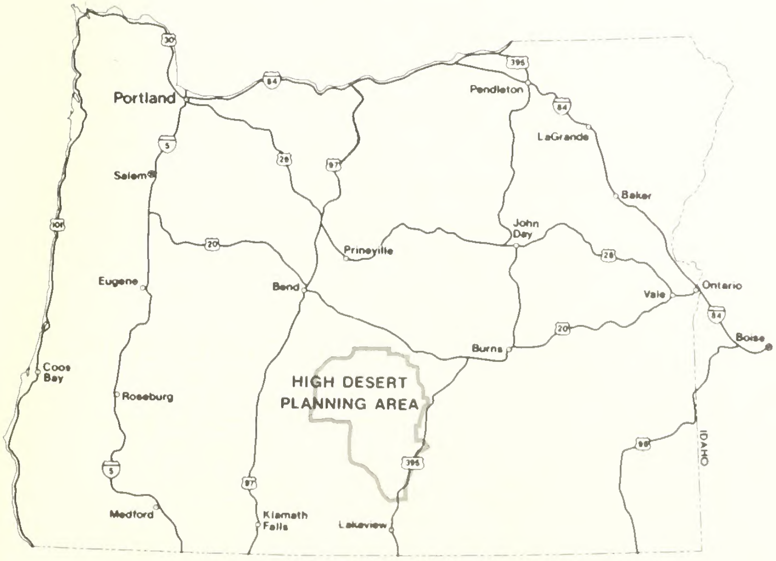
Table 4. Existing Livestock Use, Four Craters Lava Bed WSA (OR-1-22)

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Current Percentage of Allotment in WSA	Current Estimated Use in WSA (AUMs)
East Green Mtn. (101)	980	4/21-11/30	23	387
Crack in the Ground	298	5/01-9/15	23	236
Totals	1,278			623

Table 5. Effects of Alternatives on Local Personal Income, Four Craters Lava Bed WSA (OR-1-22) (1981 price levels)

Item	Unit of Measure	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Livestock Grazing	AUMs	no change	no change	no change	no change
Mineral Development:					
Non-metallic mines	Number	0	0	0	1
Recreation Use	RVD	+50	+50	+50	+50
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES					
Livestock Grazing	$	0	0	0	0
Mineral Development:					
Non-metallic mines	$	0	0	0	unknown
Recreation Use	$	+600	+600	+600	+600
Total	$	600	600	600	600





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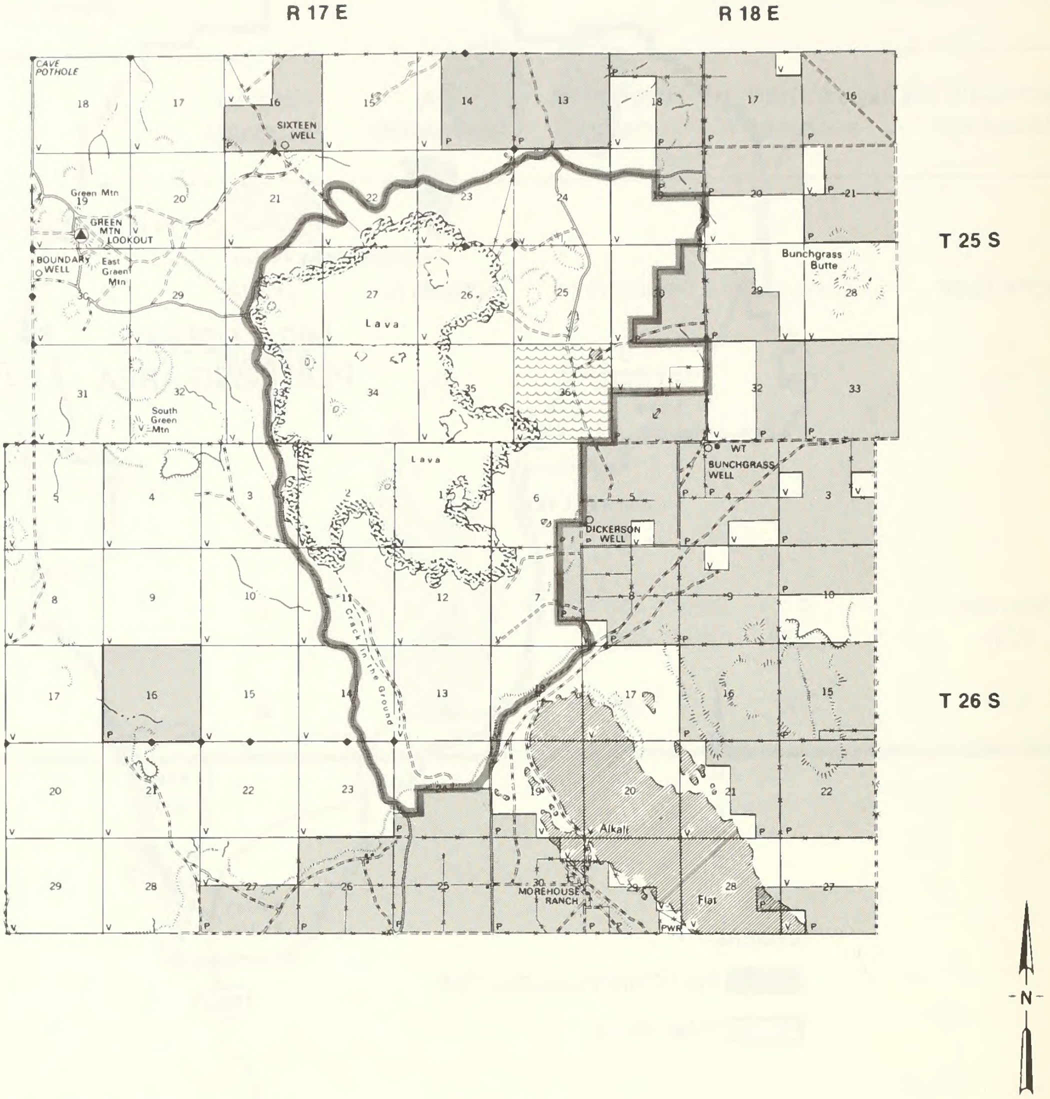
Four Craters Lava Bed WSA
OR-1-22

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▭ BLM Land in WSA Studied Under Section 603 of FLPMA
- ▬ Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▩ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)
- ▨ Edge of Lava

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Four Craters Lava Bed WSA
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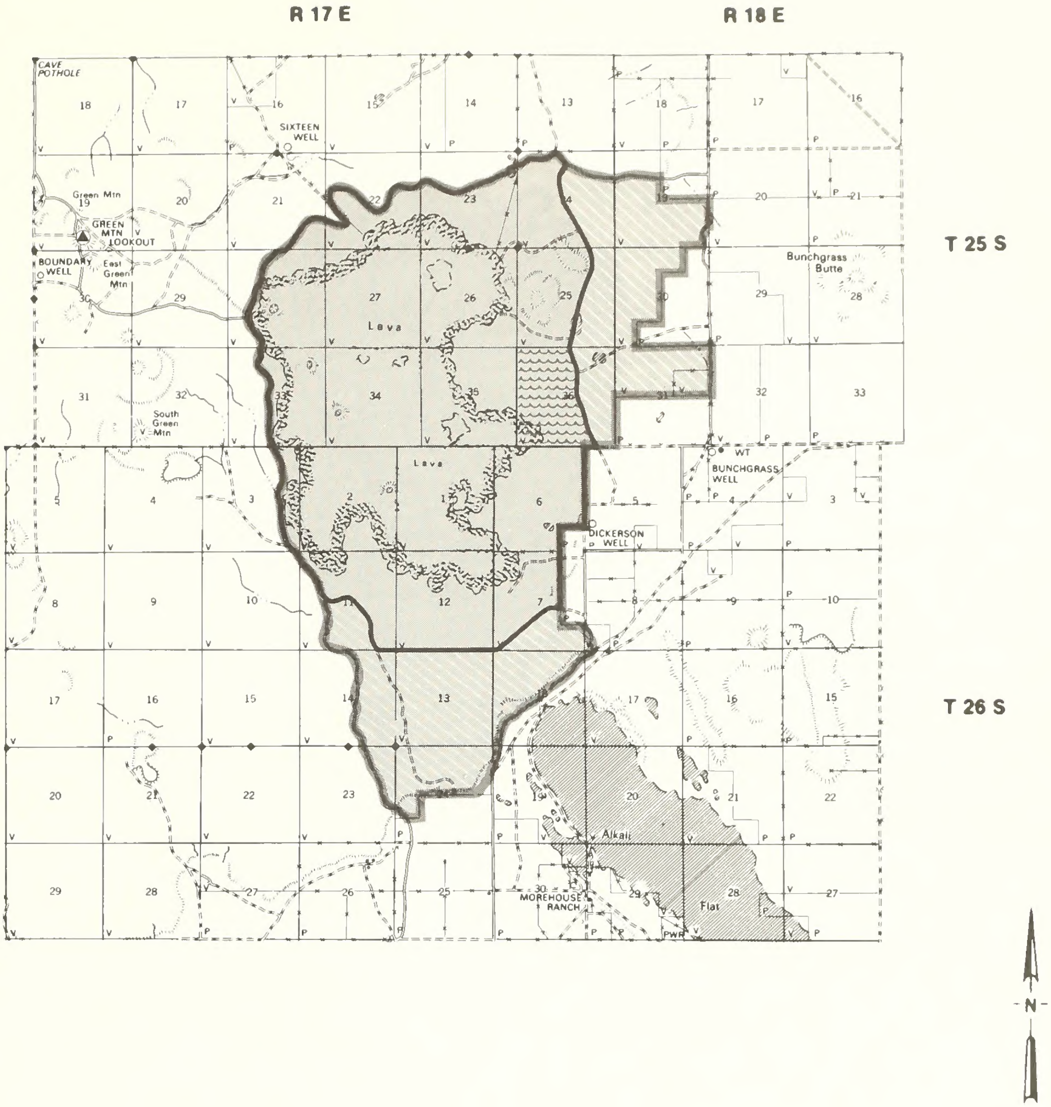
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

≋ Non-Federal Minerals (Split Estate)
within Area Recommended for Wilderness

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Four Craters Lava Bed WSA
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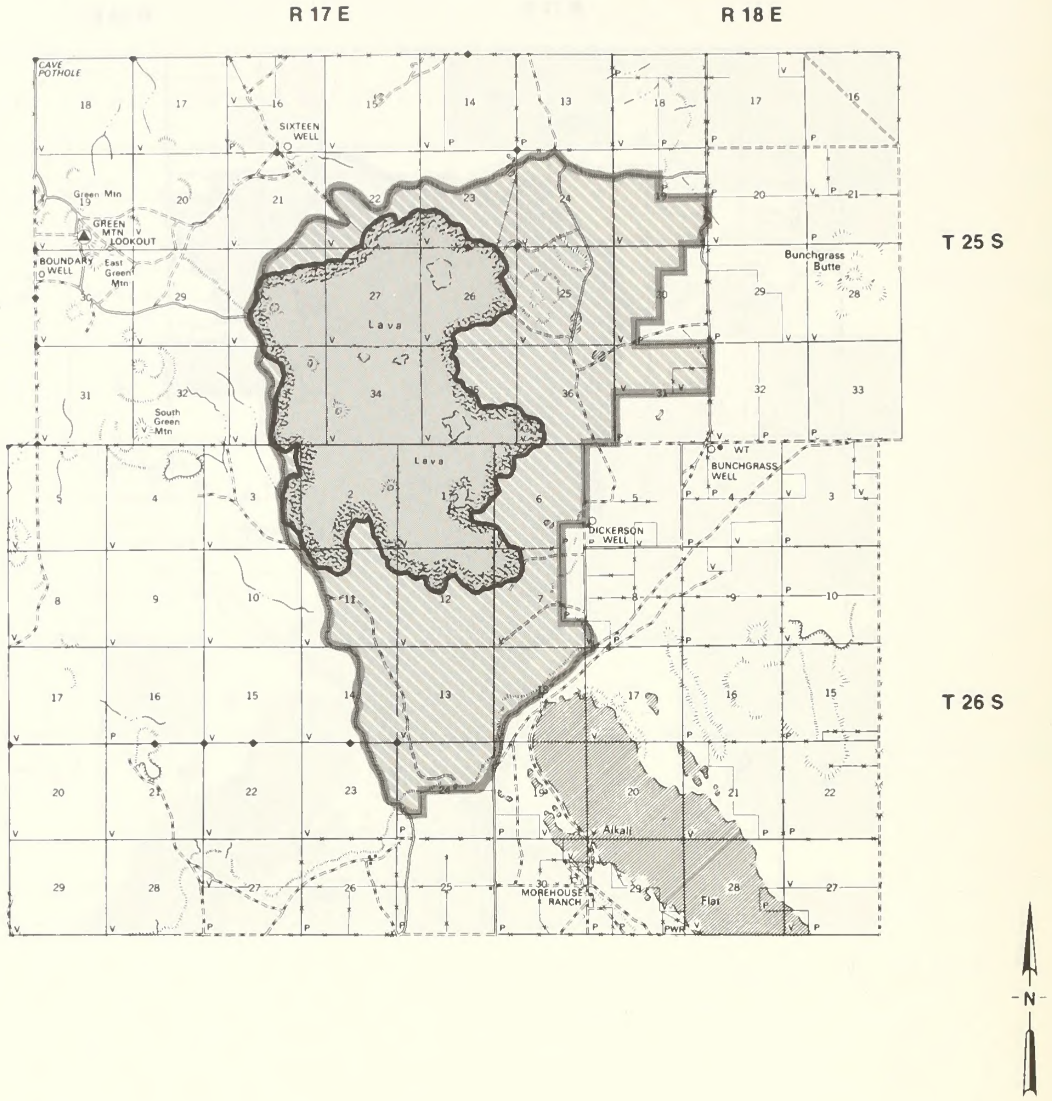
PROPOSED ACTION

1 0 1 2 MILES

MAP 3



— Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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Four Craters Lava Bed WSA
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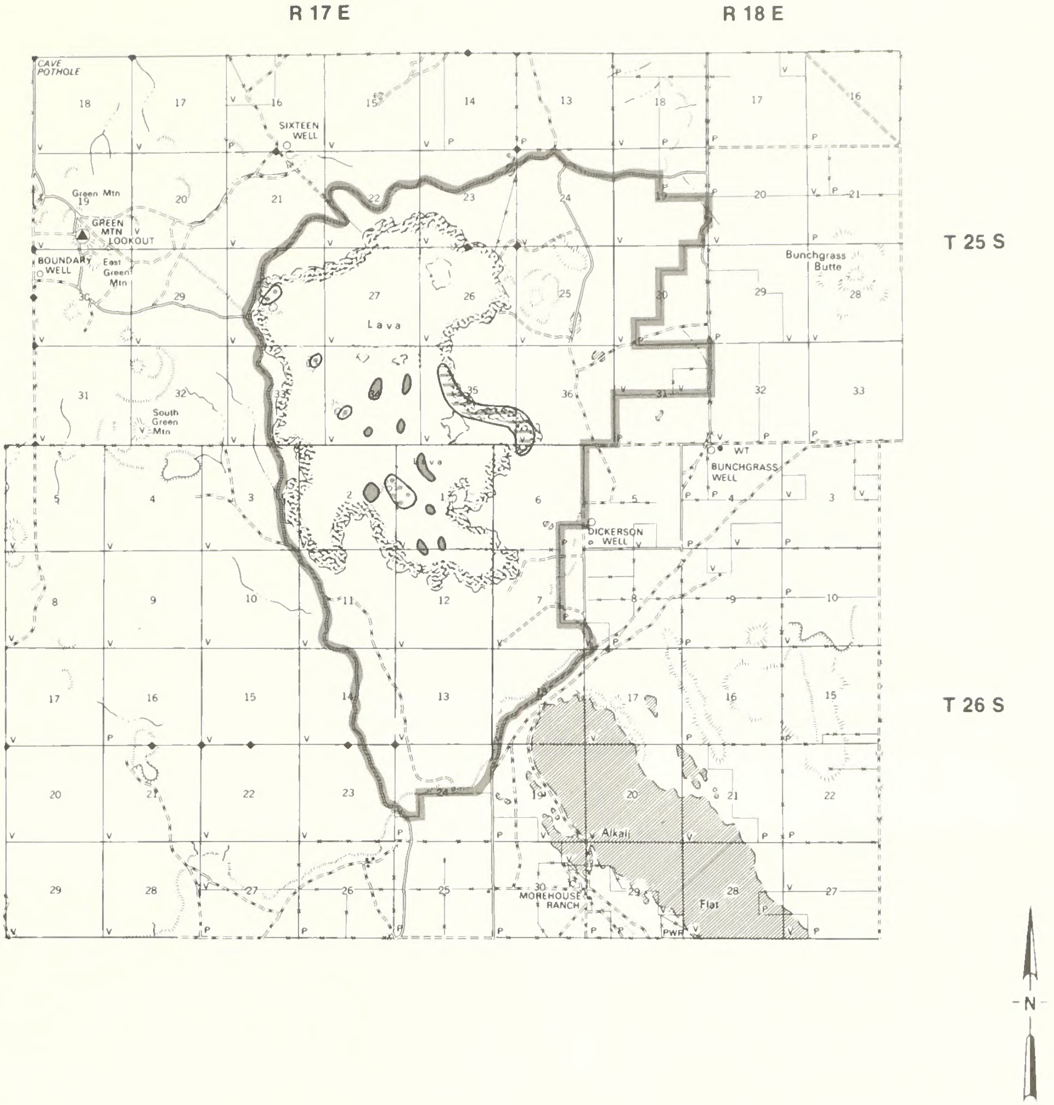
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4



Entire WSA:
Moderate Potential
(MB) for Geothermal Resources

▓ **High Potential (HD) for Slab Lava**

▤ **Moderate Potential (MD) for Slab Lava**

░ **High Potential (HD) for Cinders**

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Four Craters Lava Bed WSA
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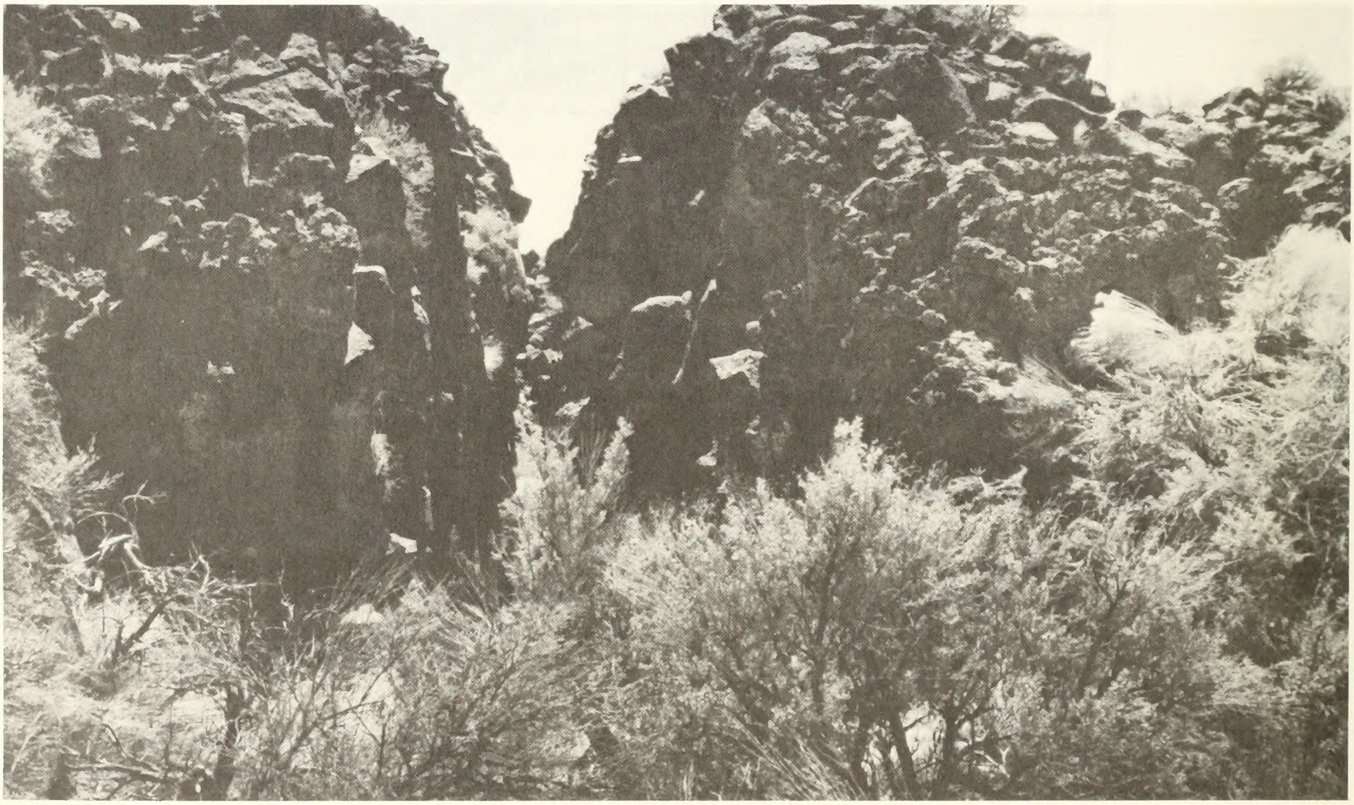
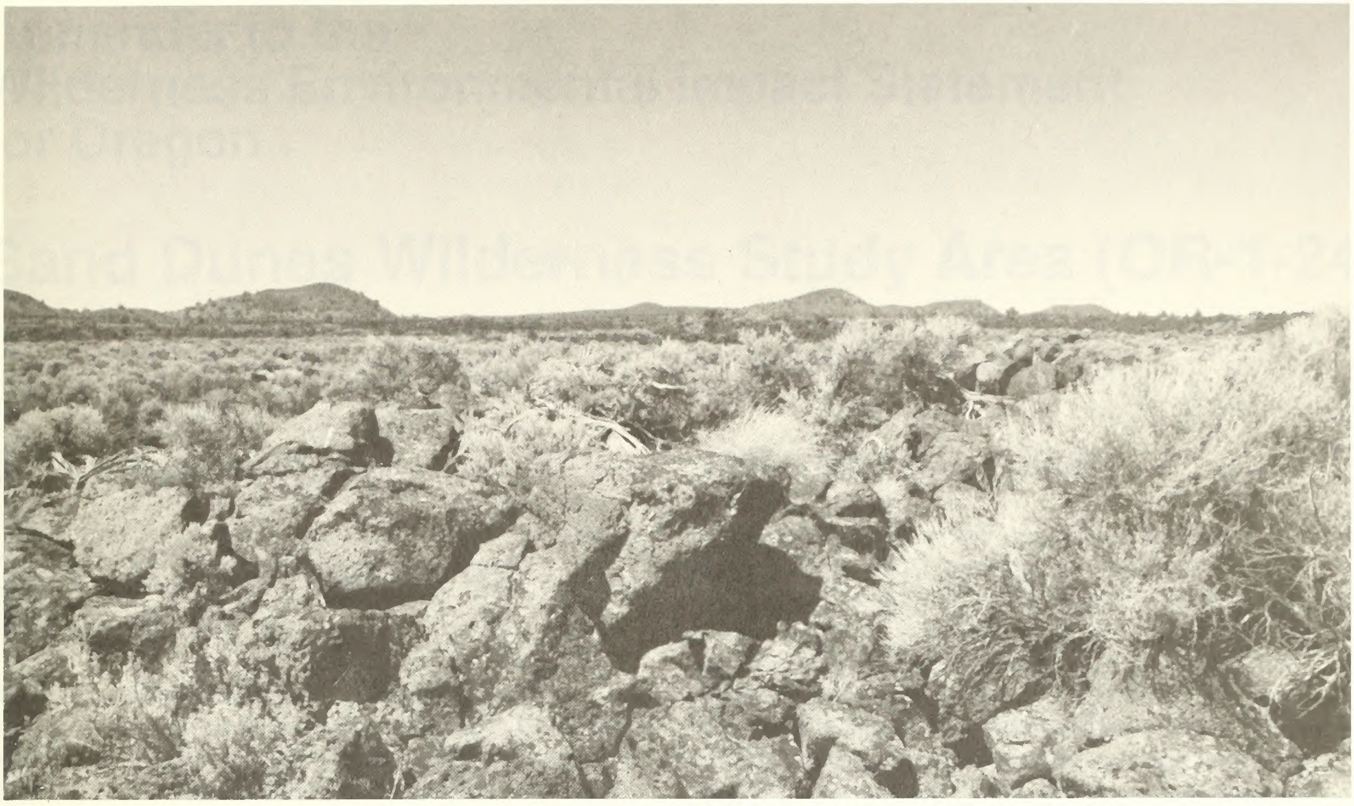
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

MAP 5

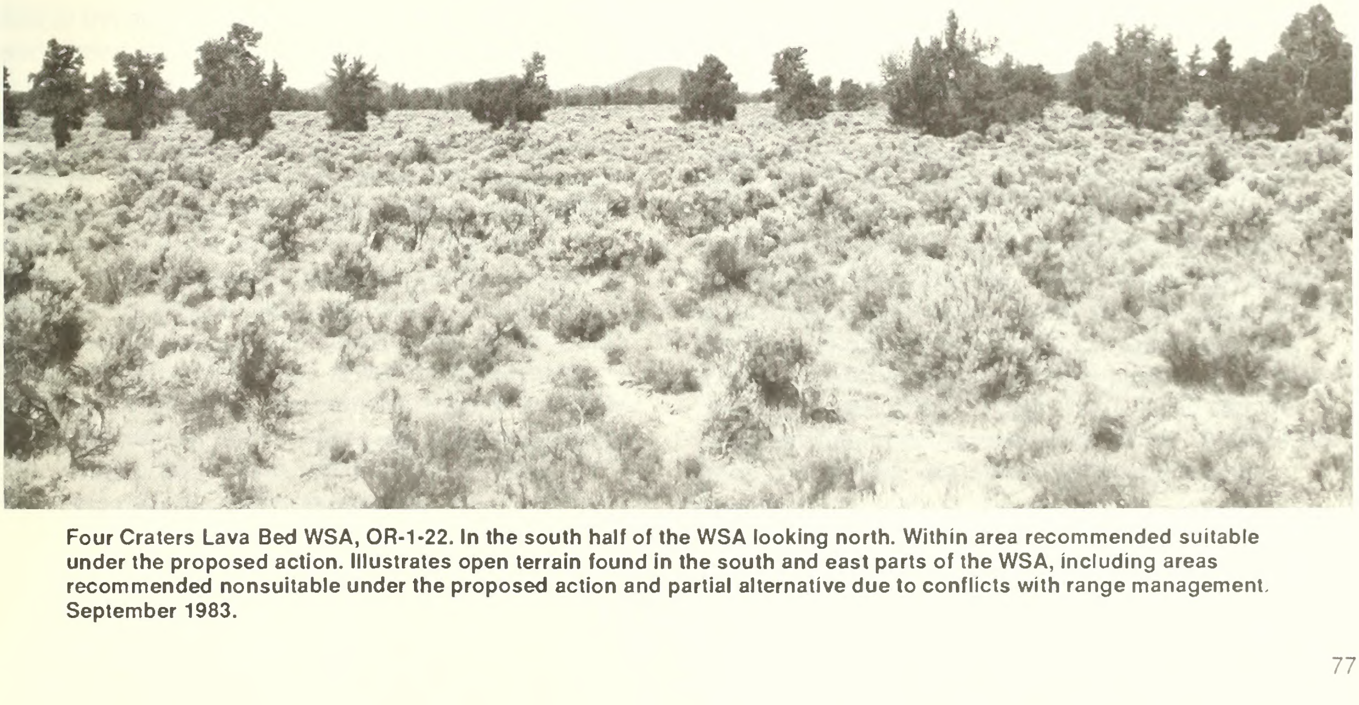
Four Craters Lave Bed WSA, OR-1-22. Central crater on the west side of the WSA. Within area recommended suitable under the proposed action and partial alternatives. Illustrates terrain typical of the majority of the WSA. September 1983.



Four Craters Lave Bed WSA, OR-1-22. In the southeast corner of the WSA. Within the area recommended suitable under the proposed action. Shows a lava stress fracture similar to the "Crack-in-the-Ground" on the west side of the WSA. May 1982.



Four Craters Lava Bed WSA, OR-1-22. Cinder cone and lava flow on the west side of the WSA. Within the area recommended suitable under the proposed action and partial alternative. Typical of the terrain in the west side of the WSA. June 1979.



Four Craters Lava Bed WSA, OR-1-22. In the south half of the WSA looking north. Within area recommended suitable under the proposed action. Illustrates open terrain found in the south and east parts of the WSA, including areas recommended nonsuitable under the proposed action and partial alternative due to conflicts with range management. September 1983.

[illegible]

[illegible]

Appendix to the Wilderness Environmental Impact Statement for Oregon

Sand Dunes Wilderness Study Area (OR-1-24)

1. Introduction

General Description of Study Area

The Sand Dunes Wilderness Study Area (WSA) is located in Lake County, 9 miles northeast of the small town of Christmas Valley, Oregon (see Map 1). It is about 70 miles southeast of Bend, Oregon, approximately 30 miles north of Oregon Highway 31, and 30 miles west of U.S. Highway 395.

The WSA contains 16,440 acres, all of it public land (see Map 2). Lands surrounding the study area are used primarily for livestock grazing and recreation. Most of the land outside the area is public land managed by BLM. Small portions of the WSA boundary abut private land. Boundaries on the remainder of the WSA are defined by low standard roads on the north and east, a 750-kV powerline right-of-way on the west, and by legal land subdivisions on the south.

Most of the study area is composed of unstabilized sand dunes which rise to a maximum height of about 60 feet. Vegetation in the dunes is somewhat limited. Pockets of vegetation exist between the dunes and surrounding ephemeral seeps on the south portion of the WSA. There is some vegetative stabilization of the dunes on the south and east portions of the WSA, and there are some juniper trees on the eastern margin of the dunes near the study area boundary. A portion of the WSA (inside Lost Forest) contains sagebrush, juniper and ponderosa pine. There is no perennial water in the area. A well drilled several years ago in the dunes on the north edge of the study area is not actively used. There are seasonal springs in the south portion of the WSA and on private inholdings near the north boundary.

Interrelationships

A 960-acre portion of the Lost Forest Research Natural Area (RNA) is within the WSA (see map 3). The boundary road of the WSA separates this portion of the RNA from the remainder of the RNA. The RNA was designated in 1972 for research purposes and receives special management, including withdrawal from mineral entry. The RNA area is within a "limited" off-road vehicle designation with vehicles restricted to roads or trails posted open. The sand dunes are "open" to vehicles equipped for travel across sand or snow. The Lost Forest consists of a disjunct stand of ponderosa pine occurring in a climate lower in rainfall than that normally associated with this vegetative community. The sand dunes, the sandy soils within the Lost Forest, and associated vegetation represent a complex and unique ecosystem.

All research natural areas and primitive areas in existence at the time of the Federal Land Policy and Management Act (FLPMA) were designated as Instant Study Areas (ISA). They were so named because the deadline for completion of the wilderness study was accelerated from the 1991 reporting date for the remaining wilderness study areas to be identified in inventories. The BLM Oregon State Director's 1979 report on the Lost Forest Instant Study Area concluded that the Lost Forest ISA did not have wilderness characteristics and should not be recommended for wilderness designation. The report did conclude that the roadless portion of the Lost Forest RNA/ISA within the Sand Dunes WSA should be incorporated for further study with the Sand Dunes WSA. A portion of the WSA also includes an area closed to vehicles because it incorporates a portion of the Fossil Lake paleontologic area vehicle closure which continues to the west of the WSA. Some 4,160 acres of the WSA are within this fenced vehicle closure.

The significant resource values in the general area and potential for conflicting uses led to the Fossil Lake, Sand Dunes and Lost Forest areas being designated as an Area of Critical Environmental Concern (ACEC) in I983. The ACEC encompasses 30,000 acres, including all of the WSA.

Special management restrictions in the ACEC or RNA include:

- limiting off-road vehicles (ORVs) to existing routes in the RNA, closing the Fossil Lake area (4,160 acres) to ORVs, and allowing continued ORV use on approximately 11,320 acres,
- withdrawal of the RNA from mineral entry, and
- prohibiting firewood cutting or any other timber removal.

The management restrictions in the ACEC and RNA would continue to apply regardless of whether or not the area is designated wilderness.

The WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) Wagontire Wildlife Unit which contains 3,036 square miles of land area. The Sand Dunes WSA supports only a few transitory deer and antelope around the fringes of the dune area. ODFW management goals call for a deer herd of 1,400 animals in the Wagontire Unit. The goal for non-game wildlife is to maintain populations of naturally occurring species at self-sustaining levels. The lands in this WSA would have little or no effect upon those goals. The proposed action for this WSA conforms with ODFW's management goals for game and non-game wildlife species.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources selected as issues specifically for analysis in this WSA include:

- impact on wilderness values,
- impact on energy and mineral development,
- impact on wildlife populations unique to the Lost Forest/Sand Dunes ecosystem, and
- impact on recreation use levels, with particular concern for the analysis of change in use from heavy ORV use to primitive use.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- All Wilderness
- No Wilderness/No Action (Proposed Action)

An enhanced wilderness alternative is not analyzed because there is no feasible opportunity identified to significantly enhance wilderness values. Due to the nature and location of the study area, expansion of the area is not practical, and there are no inholdings within the core area.

No viable partial wilderness boundary was identified that would protect wilderness values while developing a less than all wilderness alternative.

All Wilderness

The all wilderness alternative would recommend all 16,440 acres of public land in the WSA as suitable for wilderness (see Map 2). For purposes of analysis, this alternative assumes the mineral estate of 400 acres of split-estate lands would not be acquired and would remain open to mineral entry.

Energy and Mineral Development Actions

Wilderness designation would close 15,080 acres to all forms of mineral entry under the mining and mineral leasing laws. Exploration and development of the moderate potential for occurrence of energy resources, geothermal or oil and gas, would be unlikely. This potential is based on indirect evidence.

Exploration or development of mineral resources is unlikely as the area has only low or no mineral potential except for diatomite, which is common throughout the region. Mineral entry is also unlikely on the 400 acres of split-estate land within the WSA, based on mineral potential.

Locatable minerals are already withdrawn from mineral entry on the 960 acres within the Lost Forest RNA.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and BLM Wilderness Management Policy. Although the WSA produces very limited amounts of big game forage, forage availability for wildlife would continue to be managed in coordination with livestock allotment management. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the current use level of 354 AUMs within the single pasture in the WSA. The season of use for this allotment (Viewpoint) is from March 1 to June 1. The character of the sand dunes and location of developments near the boundary generally precludes any need for vehicle use in livestock management. If the Sand Dunes Well was to be reopened for livestock water (pre-FLPMA development), maintenance would require one cross-country vehicle trip every 5 to 10 years. No livestock developments are proposed for the area.

Recreation Management Actions

Wilderness designation would close 11,320 acres to motorized vehicles, including 4 miles of ways. The WSA currently contains 4,160 acres closed to protect cultural and paleontologic values. An additional 960 acres under limited use designation within the Lost Forest RNA would be closed under wilderness designation. A total of 16,440 acres would be closed to recreation vehicle use by this combination of actions. Current recreation use is estimated at approximately 3,000 visitor days per year, almost entirely associated with ATV's, ORV's, and motorcycles. Primitive recreation use is estimated to account for less than 200 visitor days per year.

No Wilderness/No Action (Proposed Action)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

Under this alternative, 15,480 acres of public land minerals would be open to mineral entry. The 960 acres in the Lost Forest RNA would remain withdrawn from mineral entry. A moderate potential for the occurrence of geothermal and oil and gas resources, based on indirect evidence does not indicate a likelihood of development, but exploration including geophysical exploration would occur. There is a lack of sufficient geologic evidence to justify a major exploration/development program at this time. Diatomite potential is rated as moderate based on indirect evidence on much of the area, but as numerous locations of diatomite are found nearby and in eastern Oregon, development at this location is unlikely.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. Although the WSA produces very limited amounts of big game forage, forage availability for wildlife would continue to be managed in coordination with livestock allotment management. No wildlife projects are proposed.

Livestock Management Actions

Livestock grazing would continue at 354 AUMs, with a season of use as identified in Table 4. Vehicle use for livestock management would occur cross-country and on the 4 miles of way in the area designated open to vehicles. The physical character of the sand dunes does not lend itself to the use of vehicles for livestock management activities other than well maintenance at sand dunes well.

Recreation Management Actions

Off-road vehicle use would continue to be allowed on 11,300 acres of unstabilized sand dunes in the WSA under the no wilderness/no action alternative. A vault toilet would be installed to solve sanitation problems in the high use area near the north boundary of the WSA, approximately one-quarter mile west of the Lost Forest. A juniper grove at the edge of the dunes has become the most popular location for ORV groups to camp and gather.

The 960 acres in the Lost Forest RNA would remain limited to vehicle use on designated roads and trails only. The portion of the existing Fossil Lake vehicle closure within the WSA would continue to be closed on 4,160 acres to vehicles in order to protect archeological and paleontological resources.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears to be generally natural. A natural appearance is maintained in most of the WSA because the shifting sand quickly alters evidence of human activity.

Photo stations have been established to monitor the appearance of the dunes and a vegetated area west of the Lost Forest to document changes in vegetative cover and impacts to the natural systems by ORV use. A comparison of aerial photos from the 1950's with photos taken in 1976 does not demonstrate any gross visual changes in the area with the advent of ORV use. Saltgrass areas in the northern portion of the WSA are crossed by several deeply cut ways. These ways are in the vicinity of Mound Springs and Sand Dunes Well, with significant portions of the ways on private land outside the WSA. The vehicle ways total approximately 4 miles within the WSA and are not noticeable unless viewed along their routes.

The capped casing of a currently unused well is located on the north edge of the WSA. There are 7 miles of fence in the WSA, 3 miles located on the far east perimeter, and 4 miles in the southwest corner of the WSA as part of the Fossil Lake ORV closure. These fences do not have any substantial effect on the naturalness of the area as a whole. The east perimeter fence described in the Draft EIS has been replaced by one closer to the boundary road. Portions of the original fence lie buried under the shifting dunes. Approximately 15 acres are directly impacted by unnatural features within the WSA, while less than 300 acres or approximately 2 percent of the WSA, are visually impacted.

A 750-kV powerline paralleling the west boundary of the WSA is an outside influence that can be seen for a distance of approximately 1 mile within the WSA. The United States Air Force is currently constructing a backscatter radar site immediately outside the south boundary near the east to west center of the WSA. The site antennae will be in three arrays or segments, each array will be 1 mile long. Towers in each array will be from 35 to 160 feet in height. This development will dominate much of the foreground and middleground viewshed south of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The Sand Dunes WSA offers outstanding opportunity for a visual sense of solitude in the central core where the largest sand dunes occur, and where distance from the boundary exceeds 1 mile. This is approximately one-third of the WSA. Opportunities for visual solitude on the northern and western fringes of the WSA are limited by open terrain. In the Lost Forest portion of the WSA, visual isolation is aided by the juniper cover and scattered pines.

Sound generating activities related to agriculture and recreation use outside the WSA strongly influence the open, flat, terrain on the west and northern portions of the WSA. Sound carries readily across the entire WSA. The opportunities for a complete sense of solitude in the Sand Dunes WSA are therefore particularly influenced by sounds of equipment and human activity originating outside this WSA.

Opportunities for primitive recreation in the WSA include photography, hiking, camping, nature study and sightseeing in a unique ecosystem. Such recreation opportunities are outstanding as they are not matched elsewhere in Oregon. The coastal dunes along the Pacific Ocean have a different character, as do the dunes of the Alvord Desert and other smaller dune areas in the eastern part of the State.

The WSA offers outstanding and unique opportunity for observation and study of paleontological materials. The Fossil Lake area is the "type site" (where a species is first discovered) for a number of fossil species. Collection of other than invertebrate fossils is prohibited by law.

Special Features

The Sand Dunes WSA includes the major portion of the largest inland moving sand dune system in Oregon and possibly the Pacific Northwest. This large sand dune system and the resulting complex soil conditions is projected by researchers to contribute to the preservation of the Lost Forest, a disjunct stand of ponderosa pine growing in an area of low rainfall (about 9.5 inches annually). Higher amounts of rainfall (14 or more inches) are normally required for this species. Due to the sand dunes and water retention in the soils, the pine forest survives in this low-rainfall area.

The area has numerous cultural and paleontological sites and has been recognized as extremely important for the study of Pleistocene-age animals. It contains one of the few areas where the prehistoric human inhabitants can be associated with now extinct animals. The Early Man sites have been dated to a period some 8,500 years ago. The area is unique in the archeological record of the Northern Great Basin.

The unstabilized dune system provides a stark visual and ecological contrast with the surrounding high desert terrain which is highly scenic. The dunes offer a dramatic interplay of light and texture for esthetic and artistic recreation activities.

Diversity in the National Wilderness Preservation System (NWPS)

Based upon the Bailey-Kuchler system of classifying ecosystems, the Sand Dunes WSA is located in the Intermountain Sagebrush province and has a potential natural vegetation of sagebrush steppe. Indicative of the unique character of the area, the vegetative communities listed in the High Lava Plains portion of the Oregon Natural Heritage Plan and occurring in the WSA are: ponderosa pine/big sagebrush communities, ponderosa pine-western juniper/big sagebrush community, dunes and shifting sands vegetation, playas and associated greasewood flats.

The WSA is within 5 hours' driving time of four standard metropolitan statistical areas with population over 100,000: Eugene/Springfield, Portland, Medford, and Salem, Oregon.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data in a report prepared by the U.S. Geological Survey and U.S. Bureau of Mines titled "Mineral Resources of the Lost Forest Instant Wilderness Study Area, Oregon." The area has been classified according to a rating system that indicates both the level of potential for occurrence (geologic potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 gives the energy and mineral potential classifications for the WSA. Map 4 shows where energy and mineral resources have moderate potential for occurrence in the WSA.

Most of the WSA is covered by Late Pleistocene and Holocene active and stabilized sand dunes, and underlain by Pleistocene lake deposits and Tertiary basalts and tuffaceous sedimentary rocks. The older subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

The WSA has moderate potential for geothermal energy based upon fairly recent volcanism and above-normal heat flow characteristic of most of southeastern Oregon. Based upon a statewide pattern of oil and gas potential, and the possibility of marine sedimentary rocks at depth, the entire WSA is rated with a moderate potential for the occurrence of oil and gas.

There were no geothermal or oil and gas leases in the study area as of October 16, I987.

Mineral Resources

Most of the WSA has moderate potential for diatomite based on indirect evidence. No deposits are evident on the surface. There were no mining claims in the study area as of October 16, 1987.

Vegetation

The eastern end of the WSA contains the Lost Forest, an isolated remnant population of ponderosa pine. This portion of the WSA also contains junipers, big sagebrush, rabbitbrush, Idaho fescue, Indian ricegrass, squirreltail grass and big bluegrass. Most of the remainder of the WSA contains a salt desert shrub community which is characterized by greasewood, spiny hopsage, big sagebrush, rabbitbrush, shadscale, saltgrass, Great Basin wildrye grass, creeping wildrye grass and Indian ricegrass. This community occurs throughout the sand dunes area, except on the large moving sand dunes where little or no vegetation occurs.

The ponderosa pine community is in a near potential natural climax condition. The sand dune communities are in a mid- to late seral stage. There are no known threatened and endangered plant species within the WSA.

Wildlife

The WSA supports few big game mammals such as deer and antelope, but supports a variety of non-game mammals in the different ecosystems within its boundaries. Black-tailed hare and mountain hare (jackrabbits), pigmy rabbits, least and yellow pine chipmunks, Townsend and golden-mantled ground squirrels, deer mice, pocket mice and northern grasshopper mice occur in various parts of the WSA. Coyotes are common in the area and badger occur in lesser numbers. Bobcat and mountain lion are occasionally reported around the area.

Bird species using the area for part, if not all, of their habitat needs during the course of the year are widely varied and include horned larks, sparrows, blackbirds, sapsuckers, common flicker and mountain bluebird, as well as larger and more prominent species such as red-tailed hawk, prairie falcon and golden eagle. A number of reptiles are known to occur in the area, although no complete species list has been compiled.

Watershed

There are no perennial streams or springs in the WSA.

Livestock Grazing

The WSA is entirely within the Viewpoint grazing allotment. The licensed livestock allocation in the sand dune portion of the allotment is 354 AUMs. (See Table 4.)

The character of the sand dunes generally precludes any opportunity for range improvements. Existing livestock improvement projects in the WSA are approximately 3 miles of fence and an old well not currently in use.

The grazing operator currently uses horses for livestock management within the WSA. Vehicle use for grazing management is limited to roads around the perimeter of the WSA.

Recreation Use

The sand dunes offer a unique recreation opportunity. The Alvord Desert 80 miles to the east contains sand dunes, but the terrain is primarily comprised of broad alkali flats. The dunes in the Alvord Desert are also stabilized to a greater extent by vegetation. Coastal sand dunes 200 miles to the west are comparable in structure, but draw very large numbers of recreationists in a more developed and concentrated recreational setting. The setting of the Fossil Lake dunes offers lower amounts of use (to date), providing a unique recreation opportunity.

Most recreation in the WSA is associated with off-road vehicle use. Unstabilized dunes covering 11,320 acres within the WSA remain open to vehicles specialized for use in sand dunes. The annual visitor use by off-road-vehicle recreationists is approximately 3,000 visitor days. The major portion of this use occurs on the Memorial Day weekend, with use dropping significantly in July and August. Fewer than 200 visitor days are tied to primitive recreation use of the area.

Recreation activities available in the sand dunes not directly tied to vehicles include: sightseeing, on-site study of archeological and paleontological areas with no collecting of cultural artifacts or vertebrate fossils, hiking, photography, minor hunting use and hang gliding.

Use in the dunes has increased in the past two years, with a change in activity from motorcycles and dune buggies to the use of the newer all-terrain-vehicles of three and four-wheel design. Sanitation has become a problem in congregation areas, such as the juniper grove west of the Lost Forest, on major weekends when large numbers of people occupy the dunes. A proliferation of slit trenches and makeshift sanitary facilities has occurred in recent years, primarily constructed by larger groups. A Portland State University study has projected a doubling of the population in the Bend area by the year 2000. The use concentration and sanitation problems are increasing as user numbers keep pace with the growth in the surrounding communities.

Northeast of the open dunes, 960 acres of the Lost Forest RNA within the WSA is limited to vehicle use on designated roads only. To the west of the major dune systems, the Fossil Lake vehicle closure area is fenced on 4,160 acres within the WSA and posted to preclude motorized vehicle use. Approximately 50 percent of the people drawn to the area for the ORV activity would also visit the Lost Forest and Fossil Lake during their stay. A large rock outcrop in the Lost Forest is a popular camping area, with established camping areas used heavily by ORV recreationists.

Local Personal Income

Livestock use at the current level of 354 AUMs and recreation use totaling 3,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $4,000 for livestock grazing and $36,000 related to recreation use, for an overall total of approximately $40,000. The statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each alternative. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 16,440 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and the wilderness values within the entire 16,440 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including the paleontological resource, unique ecological interrelationships with the Lost Forest, and the dune system itself would be protected.

Naturalness

The natural appearance of the constantly shifting sand dunes area, with about 300 acres affected by unnatural features, would be enhanced by prohibiting the use of ORVs and ATVs. Although the use of vehicles in the WSA generally leaves only short-term impacts, their elimination would allow the communities in the dunes to operate totally under the influence of natural processes. The elimination of heavy peak-use ORV-activity would eliminate or greatly reduce sanitation problems in the area. The presence of vehicles for nearly 3,000 visitor days per year does adversely influence the natural scene for an approximately 4-month period each year. The 4 miles of ways closed in the northern portion of the WSA would eventually fill in with soil and revegetate to a natural appearance. This process could take 10-20 years in the areas where the ways have deeply incised the vegetative mat and underlying soil structure.

Solitude

Opportunities for solitude within the convoluted terrain on and around the shifting dunes would be enhanced by excluding vehicles and their associated noise and physical disturbance.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be greatly enhanced by access restrictions on non-primitive forms of recreation and management activities using motor vehicles or mechanical means of transport. The safety of the primitive recreation user would be significantly improved with the elimination of high speed vehicle traffic in the steep dunes and hollows where the ability to see a person on foot is limited. The elimination of vehicle noise and physical disturbance would also enhance esthetic values related to the naturalness of the setting for primitive recreation activities.

Special Features

Elimination of off-road vehicles would preclude inadvertent site disturbance and damage to cultural or paleontological features caused by vehicles.

Conclusion: Wilderness designation of the entire 16,440 acres within the Sand Dunes WSA would result in the preservation and protection of wilderness values, and specifically enhance values for solitude, primitive recreation and special features.

Impacts on Energy and Mineral Development

Wilderness designation would close 15,080 acres within the WSA to mineral entry. The 400 acres of split estate would remain open to mineral exploration and development.

Energy Development

Exploration for oil and gas and geothermal resources would be precluded on 15,080 acres. Exploration could occur on 400 acres of split-estate lands. Due to the lack of geologic evidence to justify an extensive exploration/development program, only casual exploration, without development, is expected.

Conclusion: No impact to energy development is expected.

Mineral Development

Exploration for diatomite which has a moderate potential for occurrence based in indirect evidence, would be precluded on 15,080 acres. Exploration could occur on 400 acres of split-estate lands. However, due to a lack of sufficient geologic evidence to justify extensive exploration or development, and the abundance of diatomite in areas outside the WSA, only casual exploration, without development is expected.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

Vegetative composition would not be changed. Ecological status which is mainly late-seral to potential natural climax ponderosa forest or salt desert shrub communities would also not change. Four miles of vehicle ways in the northern portion would revegetate to grasses, sagebrush, or salt desert shrubs in approximately 10-20 years. There would be some potential increase in dune stabilization as a result of removing vehicles from the area.

Conclusion: Little or no change would occur to vegetation in most of the area. Four miles of vehicle ways closed to traffic would revegetate within approximately 20 years.

Impacts on Wildlife

The elimination of vehicles from 11,320 acres would protect and enhance wildlife habitat by eliminating the physical impacts of mechanical disturbance. This action would also prevent the incidental but unintentional harassment of non-game wildlife by motorized vehicle operators. Large mammal species identified as game animals rarely occupy the dunes. Current limited designations on vehicle use inside the 960 acres of the WSA within the Lost Forest RNA prohibits vehicle use in most of the game mammal habitat.

Conclusion: Habitat for existing wildlife populations would be maintained preserved or enhanced on 16,440 acres.

Impacts on Livestock Grazing

Livestock grazing would remain at the current level of 354 AUMs. Vehicle use for livestock management and facility inspection/maintenance on 4 miles of way and cross-country would be precluded under wilderness designation. This would result in only minor inconvenience to the livestock operator as most of the area is inaccessible to ranch vehicles and livestock management is currently accomplished by horseback.

Conclusion: Livestock grazing would remain at current levels of 354 AUMs.

Impacts on Recreation Use

This alternative would have a substantial impact on ORV and ATV activity, eliminating approximately 2,800 visitor days of use. Since the sand dunes provide a unique type of experience with no other suitable sites in the same region (within 100 miles), this vehicle-related activity would be eliminated within the region. This alternative would not directly affect ORV recreation activities in either the Lost Forest or the Fossil Lake area, as restrictions on vehicle use already exist. Primitive recreation use would remain at approximately 200 visitor days per year, although small increases will occur with increasing population in the region.

Conclusion: Wilderness designation would result in approximately a 2,800 visitor day reduction in overall recreation use in the WSA.

Impacts on Local Personal Income

Livestock grazing will remain at 354 AUMs and recreation use is expected to decline by 2,800 visitor days per year. Table 5 shows the effects on local personal income generated from these activities. The total effect would be a net decrease of $33,600 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $34,000 per year.

No Wilderness/No Action (Proposed Action)

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 16,440 acres.

Impacts on Wilderness Values

Under the no wilderness alternative, the entire 16,440 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and the area's special features would be subject to management under the existing ACEC designation, or Research Natural Area guidelines on the 960 acres within the Lost Forest RNA.

Naturalness

Naturalness within the WSA would be subject to continued and increasing vehicle use at the rate of approximately 100 visitor days per year, with increased trail development of approximately .5 mile per year in the vegetated areas being the most likely impact in the foreseeable future. The popularity of ATV type vehicles has been reflected in a change to these smaller vehicles from the larger four-wheel drive and dunebuggy type vehicles on automotive frames previously seen in the area. The smaller vehicles have led to increased incursion into vegetated areas.

Construction of a vault toilet would present a minor physical intrusion, but would also prevent further sanitation problems and eliminate impact of an increasing number of slit trench facilities being dug by the larger user groups.

Natural values would be preserved in the 960 acres within the Lost Forest under RNA management. ACEC designation and management would maintain the vehicle closure on the Fossil Lake area and provide the mechanism to close or control additional areas if ORV and ATV use causes additional impacts to critical values.

Solitude

Continued ORV use under this alternative would limit the opportunity for solitude within the approximately 11,320 acres remaining open to vehicle use. Existing ORV designations would maintain opportunities for solitude in 960 acres within the Lost Forest RNA and inside the 4,160 acres of the Fossil Lake closure area.

Primitive and Unconfined Recreation

Opportunities for primitive recreation would be limited on approximately 11,320 acres during intensive ORV use periods with disturbance of the natural setting and noise. In addition to the impact on the primitive setting, vehicles operating in areas with foot traffic and low visibility due to terrain would continue to present a safety concern for those on foot who are less visible and mobile than vehicle traffic.

Special Features

Management of the Lost Forest RNA in conjunction with management of the ACEC, which extends across the dunes to include the Fossil Lake area west of the WSA, would protect most of the natural features and ecotypes which make the sand dunes complex unique. However, the ACEC designation does not specifically prohibit all activities which might disturb natural features. RNA designation on 960 acres and ACEC designation of the remaining acres in the WSA would preserve the basic character of the unstabilized dune system, paleontologic, and archeological values. Opportunities for solitude and primitive and unconfined recreation would be diminished during periods of ORV use on approximately 11,320 acres. The opportunity to represent an unstabilized dune system (as recognized by the Oregon Natural Heritage Plan) within the NWPS would be foregone.

Conclusion: The opportunity to preserve this unstabilized dune ecosystem within the NWPS would be foregone.

Impacts on Energy and Mineral Development

The 15,080 acres currently open to mineral entry would remain open. Within the Lost Forest RNA, 960 acres would continue to be withdrawn from mineral entry in accord with existing orders.

Energy Development

Exploration for oil and gas and geothermal resources is expected. An extensive exploration/development program is not anticipated due to the lack of sufficient geologic evidence to support it.

Conclusion: Exploration for energy resources would occur on 1,080 acres.

Mineral Development

Although a moderate potential for diatomite is present in the WSA based on indirect evidence, this material is readily available in relative abundance outside the WSA and development within the area is not anticipated.

Conclusion: No impact on mineral development is expected.

Impacts to Vegetation

Continued ORV use would prevent recovery of vegetation on 4 miles of vehicle ways and up to .5 miles of new ATV trails in brushy areas on an annual basis. Trail expansion would directly affect less than one acre of vegetation per year. The extent of trail expansion would depend upon visitor use, and could be administratively limited to acceptable levels to suit non-wilderness criteria. The 11,320 acres of unstabilized dunes would be subject to continued vegetative disturbance from ORV use. Presently available evidence indicates that vegetative production on the unstabilized dunes has remained fairly constant because the primary use period by ORVs occurs prior to emergence and reproduction of the vegetation on the unstabilized portions of the dunes, and therefore has little impact on the growth that occurs in the unstabilized areas.

Conclusion: Disturbance to vegetation would continue on the flats between dunes, and disturbance would increase slightly in brushy areas.

Impacts on Wildlife

Management would continue to support ODFW goals for game and non-game species. Non-game species of rodents, reptiles and small mammals would continue to be disturbed by ORV use in the 11,320-acre open area of the dunes, although no quantifiable impact has been observed to date.

Conclusion: No quantifiable change in wildlife condition or habitat is expected.

Impacts on Livestock Grazing

Livestock grazing would remain at the current use level of 354 AUMs. Vehicle access on 4 miles of ways and cross-country to maintain Sand Dunes Well would be allowed. Primary livestock management activity would be by horseback.

Conclusion: No change would occur from current use level of 354 AUMs and present practices.

Impacts on Recreation Use

Recreation use in the Sand Dunes WSA is approximately 3,000 visitor days per year with minor fluctuations from year to year. The long-term trend due to increasing numbers of people in Oregon and the increased availability of ATVs would indicate increasing numbers of users in this area. A Portland State University study projects a population doubling in the

Bend area by the year 2000. Local Chambers of Commerce and community sources support a projected increase, but not as high as the PSU study.

An increase of five percent, or 100 visitor days, per year in user numbers of the Sand Dunes in the near future would be relatively accurate. It is anticipated that use will stabilize when the user numbers reach the maximum use level acceptable to users for the enjoyment of their activity. Based on comments from users, increased use would likely stabilize when approximately a 50 percent (1,500 visitor days) increase occurs. As additional areas of the coast are closed to ATVs, users may accept higher use densities in the pursuit of this activity.

ORV use would continue on the 11,320 acres open to use in the sand dunes. Use is projected to stabilize at approximately 4,500 to 5,000 visitor days annually based on carrying capacity of the area to support ORV recreation through a limited season. Construction of sanitation facilities and recreation facilities to manage use and protect resources would maintain the recreation opportunities presently available, but place greater emphasis on non-primitive use.

Conclusion: Recreation use would increase to approximately 5,000 visitor days annually, with greater emphasis on vehicle-oriented recreation. Developed facilities would enhance management and protect natural resources.

Impacts on Local Personal Income

Livestock grazing would remain at 354 AUMs and annual recreation use is expected to increase by 2,000 visitor days. Table 5 shows the effects on local personal income generated from these activities. The total effect would be a net increase of $24,000 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by $24,000 per year.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (no wilderness), use of the area for ORV activities, and the projected increase in this type of recreational activity over time, would impair the naturalness and unique opportunities for solitude and primitive recreation within the 11,320 acres open to vehicles. Minor impacts to non-game wildlife due to vehicle use would continue. No quantitative impact has been observed to date. The 960 acres in the Lost Forest RNA and approximately 4,160 acres in the Fossil Lake closure area would not be subject to this impact.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, existing short-term uses would continue. Within the Lost Forest RNA and the Fossil Lake vehicle closure areas, the long-term productivity of many of the area's wilderness values would be preserved to a considerable degree by alternate management. Loss of solitude, primitive recreation opportunity, and naturalness on the 11,320 acres open to ORV use would occur to varying degrees, dependent on time of year and specific to isolated localities within the area.

Under ACEC management, photo plots have been established and future additional research or study may be needed to develop management actions. Preservation of the natural values in the area is a primary purpose of ACEC designation, but not to the exclusion of other uses. Major changes in natural systems would not be within the scope of allowable use.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action (no wilderness), the entire area would be managed under ACEC designation to partially protect critical natural values while accommodating other uses. The 960 acres in the Lost Forest RNA would retain special emphasis on the protection of natural values relative to this disjunct pine forest. The Fossil Lake area would retain its vehicle closure to protect approximately 4,160 acres of cultural and paleontological resources. Wilderness values of solitude and primitive and unconfined recreation would be subject to comparative short-term impacts from vehicle noise and tracking, but this would not present an irreversible or irretrievable commitment. Natural values would be lost to a degree with construction of facilities such as vault toilets to accommodate recreation use. Due to the unique nature of the shifting dunes and ongoing monitoring to assure compliance with ACEC management goals, the proposed action would not represent an irreversible or irretrievable commitment of the wilderness resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The Sand Dunes WSA would not be manageable as wilderness. The openness of terrain, easy access from existing roads and the long-standing public acceptance of off-road vehicle use in the area would require an extensive commitment of personnel and resources. Physical barriers, such as extensive fencing or barricades would be required to control use. The actions necessary to enforce total ORV elimination would of themselves degrade many of the wilderness values, such as naturalness and opportunities for primitive recreation.

Comments received during the study process alluded to closures in other areas outside Oregon where vehicle closures were implemented. Notable mention was made of the Eureka Dunes area. Management conflicts continued to exist in that area with frequent violations of the closure. Apprehension of violators is difficult to pursue and not totally effective.

If other areas remained near the Sand Dunes WSA to absorb displaced users, they might offset the loss of this recreation area and mollify social attitudes. But, no such areas exist near the Sand Dunes WSA.

Rationale for the Selection of the Proposed Action

The no wilderness/no action alternative is preferred due to the major difficulties involved to manage the area as wilderness. Required management actions to eliminate ORV use would degrade wilderness values as noted in the Manageability section above.

Existing management through RNA or ACEC designation focuses on protection of natural and cultural values. The short-term loss of opportunities for solitude and primitive recreation use of the area during periods of heavy ORV or ATV use do not constitute a preclusion of this activity during much of the year.

RNA or ACEC designations do not constitute a substitution for wilderness designation for the protection of all resources. Although portions of the WSA now contain wilderness values, substantial portions of the area do not possess wilderness characteristics. This was initially described in the Wilderness Final Inventory Decision for Oregon dated November 1980.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: Inadequate discussion of impacts of ORV's on archeological, paleontologic, vegetative and wildlife resources.

Response: The primary locations of paleontologic and archeological resources in the area are already subject to ORV closure and have been fenced to preclude use. Review of available resource data on vegetation and on wildlife has revealed no reliable trend in ORV effects in the area. Photo comparison of the dunes in the 1950's against 1976 photos shows no significant change in dune or vegetation patterns beyond what would be projected under natural conditions. Although use has localized short-term effects that can be observed, no long-term condition trend is indicated by available data. Studies are still ongoing in areas of heavy ORV use.

Comment: Eureka Dunes were closed to ORVs.

Response: The Eureka Dunes experience is not directly relevant to this study area. Many acres of usable ORV dune areas remain near Eureka Dunes, while the situation in Christmas Valley is not similar. There are also indications that ORV use persists in some areas where use was established before closures were implemented.

Comment: Additional wildlife species occur in the area.

Response: The affected environment section has been reviewed to address primary species using the area. This appendix is not intended to represent a complete species list.

Comment: The DEIS failed to give adequate emphasis to the role of dunes in water storage for Lost Forest and impact on pines, and the potential alteration of that system by ORV's.

Response: Air photos from the 1950's when compared to 1976 photos do not reveal a significant change in dune patterns. No impacts from surface action of projected numbers of ORV's would be expected to affect water tables based on available data.

Comment: Draft failed to give adequate emphasis to scientific and educational value of prehistoric inhabitants.

Response: Cultural values are addressed in Special Features sections.

Comment: Fragile dunes and transient plant communities at the bottom of dunes are being damaged..

Response: This analysis considers these effects which are addressed in the Vegetation and Naturalness sections of the appendix.

Comment: Impact of backscatter site is not fully analyzed.

Response: The backscatter radar site is located outside the WSA to the south and is addressed in solitude sections, as outside sights and sounds.

Comment: BLM should expand the RNA as an alternative, or designate Lost Forest wilderness.

Response: Inventory of the Lost Forest as an Instant Study Area did not find the area suitable for further study. The decision of the Oregon State Director was to postpone final resolution until completion of the study on the Sand Dunes WSA which includes 960 acres of the Lost Forest RNA. Expansion of the RNA was not considered in this EIS, which analyzes the impacts of proposals to amend the existing land use plan for wilderness designation only. Additional RNA designations would be considered in future resource management plans.

Table 1. Summary of Proposed Management Under Each Alternative, Sand Dunes WSA (OR-1-24)

Proposed Management	All Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	16,440	0
Acres Closed by Wilderness Designation[1]	11,320	0
Miles of Ways Closed	4	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation[2]	15,080	0

[1] Approximately 4,160 acres are currently closed to vehicle use under the existing land use plan.

[2] Approximately 960 acres are currently withdrawn from all forms of mineral location under the Lost Forest Research Natural Area designation.

Table 2. Summary of Environmental Consequences of Alternatives, Sand Dunes WSA (OR-1-24)

Resource or Activity	All Wilderness	No Wilderness/No Action (Proposed Action)
Wilderness Values	Would add 16,440 acres to the NWPS and preserve unique paleontological, cultural, and natural features. Solitude would be enhanced by prohibiting vehicles. Mineral development of split-estate lands could impair wilderness values.	Continued ORV use would preclude solitude potential during high use periods and adversely affect primitive recreation. Disturbance of natural values would continue. Potential mineral exploration could adversely affect wilderness values and multiple resource benefits.
Energy and Mineral	No impact to mineral development is expected since none is projected.	No Impact. WSA open to mineral development, except in 960 acres within RNA already closed to mineral location.
Vegetation	Vegetation preserved. Vegetative recovery on 4 miles of vehicle ways closed.	Minor continued disturbance to vegetation.
Livestock Grazing	Minor change in management practices due to access limitations.	No impact.
Recreation Use	Loss of approximately 2,800 visitor days annually due to elimination of ORV use. Quality of primitive experience enhanced.	Potential increase in ORV use to approximately 5,000 visitor days annually. Sanitation facilities developed for users.
Local Personal Income	Annual local personal income generated from resource outputs in the WSA would decrease by approximately $34,000.	Annual Local personal income generated from resource outputs in the WSA would increase by $24,000.

Table 3. Classification of Energy and Mineral Potential, Sand Dunes WSA (OR-1-24)

Commodity	Area	Level of Potential	Level of Certainty
Evaporites (sodium, potassium)	Part of area(not shown on map)	L	B
	Rest of WSA	0	B
Metals(mercury, copper, silver, gold)	Part of area(not shown on map)	L	B
	Rest of WSA	L	B
Geothermal	Entire WSA	0	A
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil and gas	Entire WSA	M	B
Limestone	Entire WSA	L	B
Bentonite	Entire WSA	0	B
Diatomite	See map 4	M	B
	Rest of WSA	L	B
Zeolites	Entire WSA	L	B

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

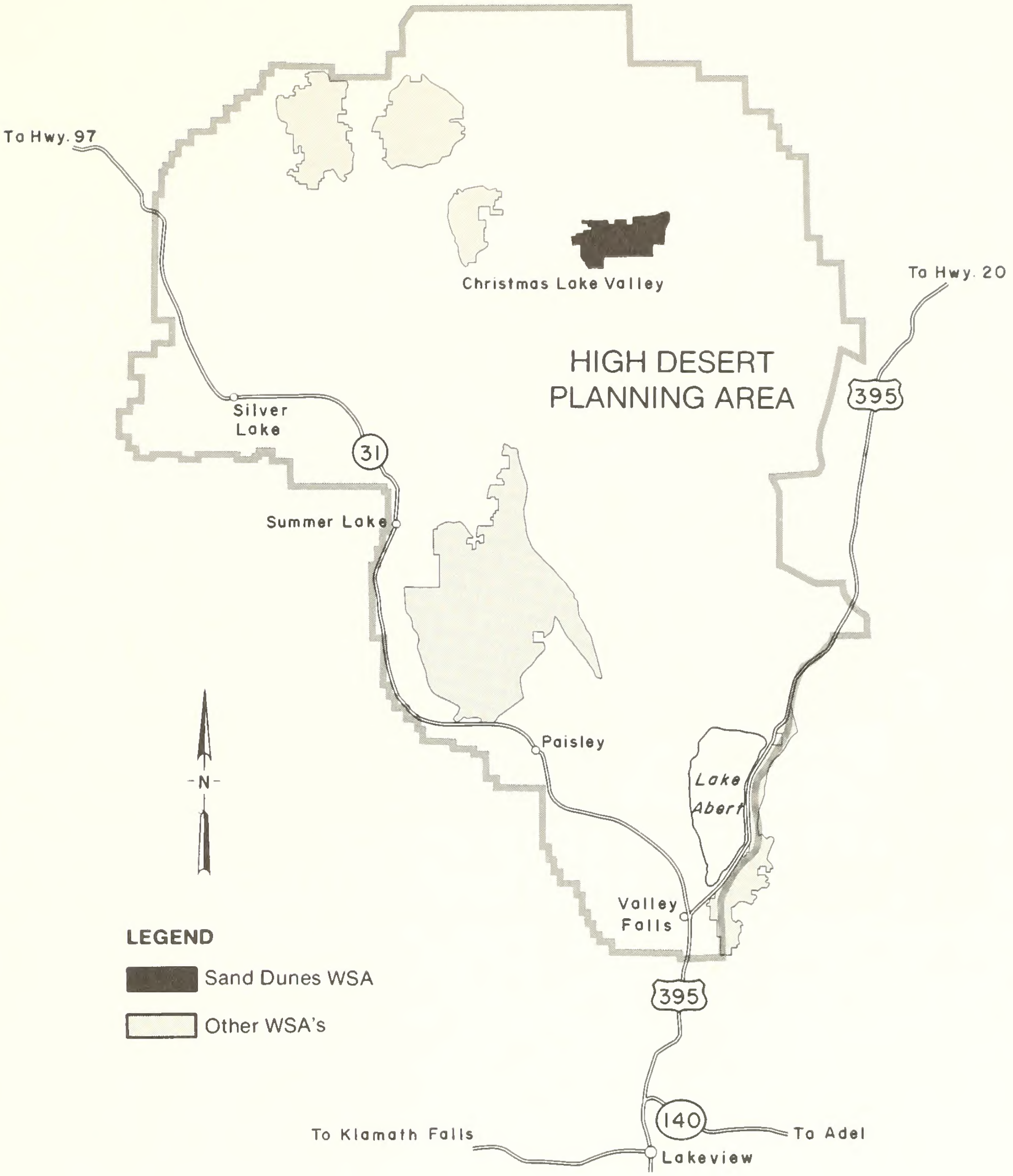
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

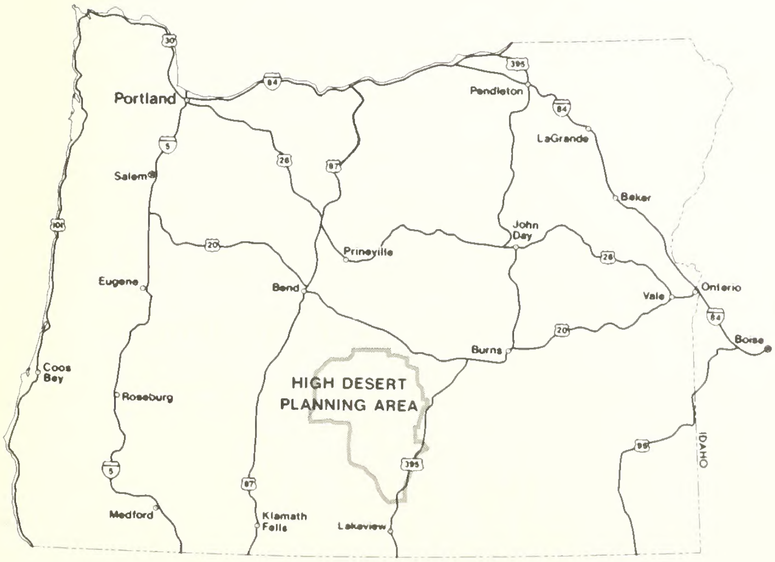
Table 4. Existing Livestock Use, Sand Dunes WSA (OR-1-24)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA(AUMs)
Viewpoint No. (103)	29,169	3/01-6/01	34	354

Table 5. Effects of Alternatives on Local Personal Income, Sand Dunes WSA (OR-1-24) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Livestock Grazing	AUMs	No Change	No Change
Recreation Use	RVD	-2,800	+2,000
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES			
Livestock Grazing	$	0	0
Recreation Use	$	-33,600	+24,000
Total	$	-33,600	+24,000





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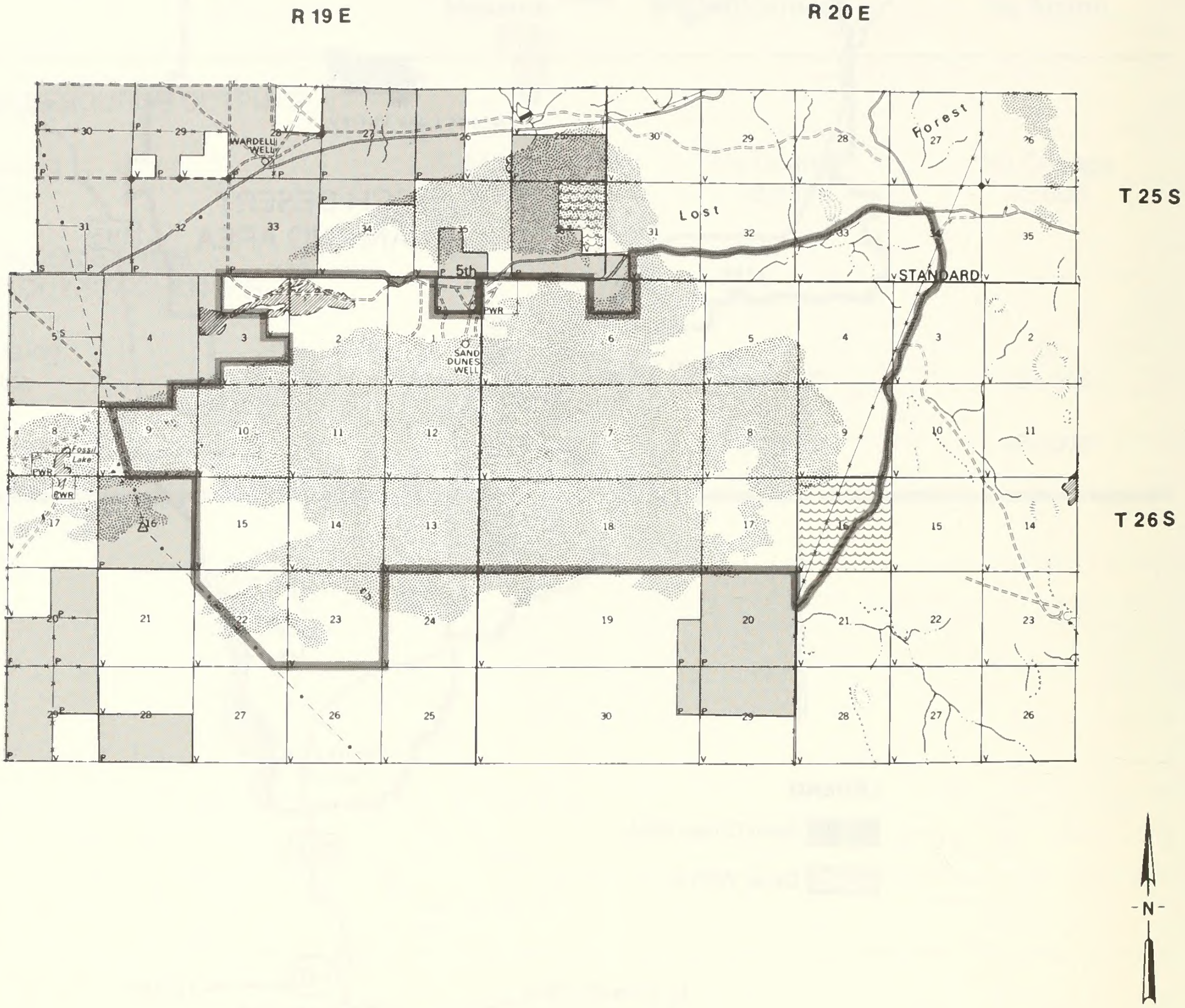
Lakeview District

Sand Dunes WSA
OR-1-24

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ Private

〰 BLM Surface-State or Private Subsurface (Split Estate)

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Sand Dunes WSA
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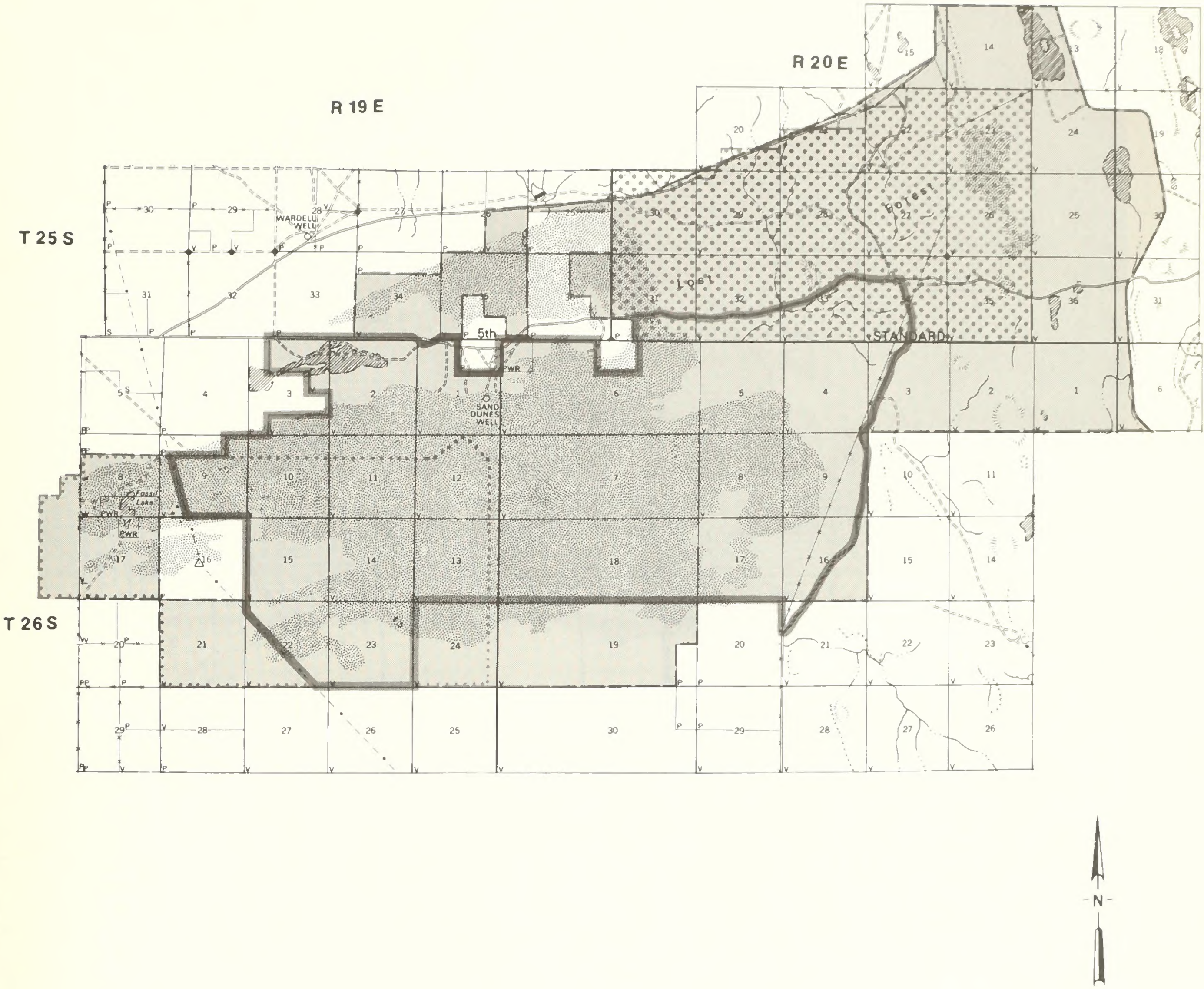
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

▨ Lost Forest-Sand Dunes-Fossil Lake ACEC

⁘ Lost Forest RNA

······ ORV Exclosure Fence

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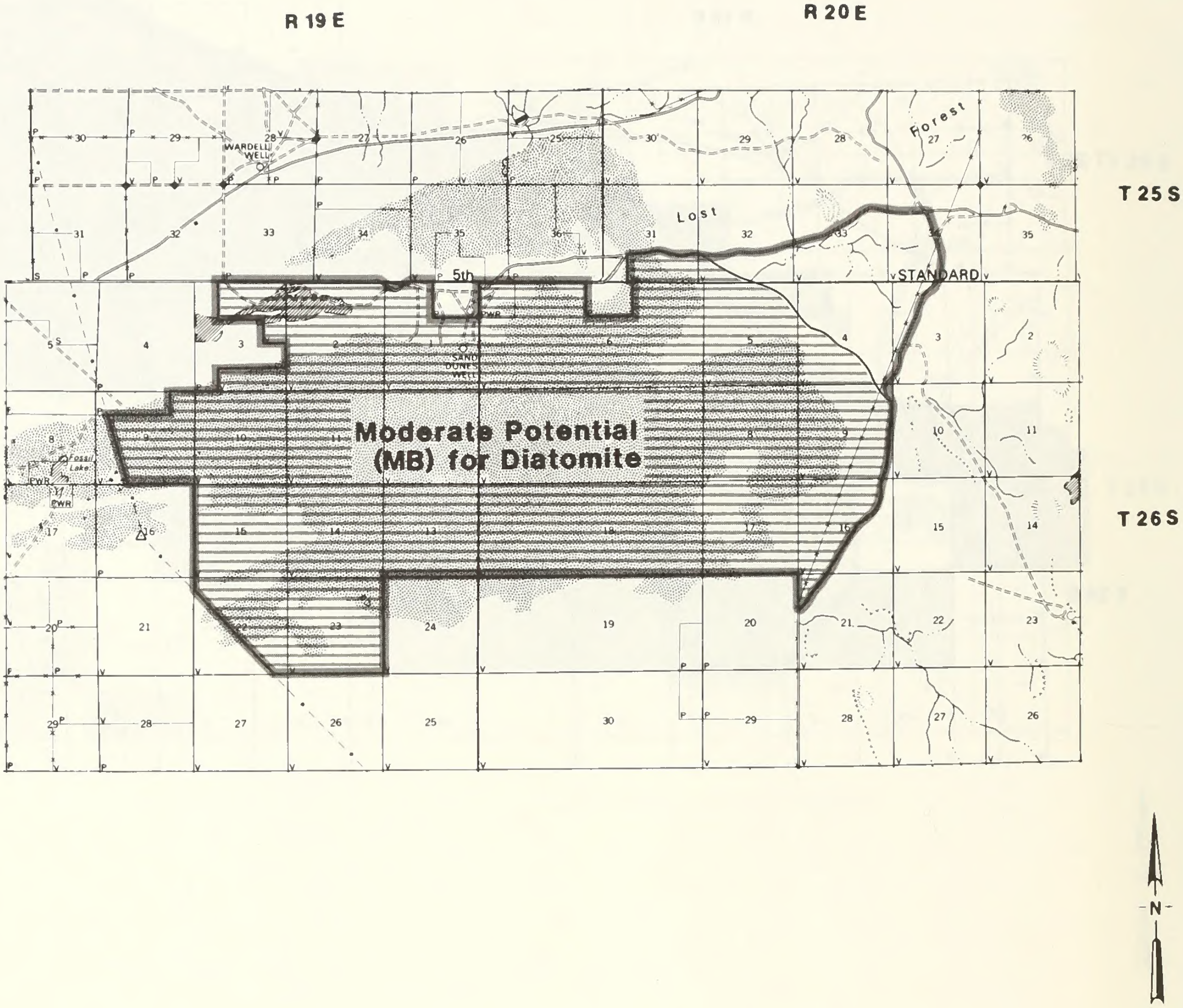
Sand Dunes WSA
OR-1-24

AREA OF CRITICAL ENVIRONMENTAL CONCERN & RESEARCH NATURAL AREA

1 0 1 2 MILES

MAP 3



Entire WSA:
Moderate Potential
(MB) for Geothermal Resources
and for Oil and Gas

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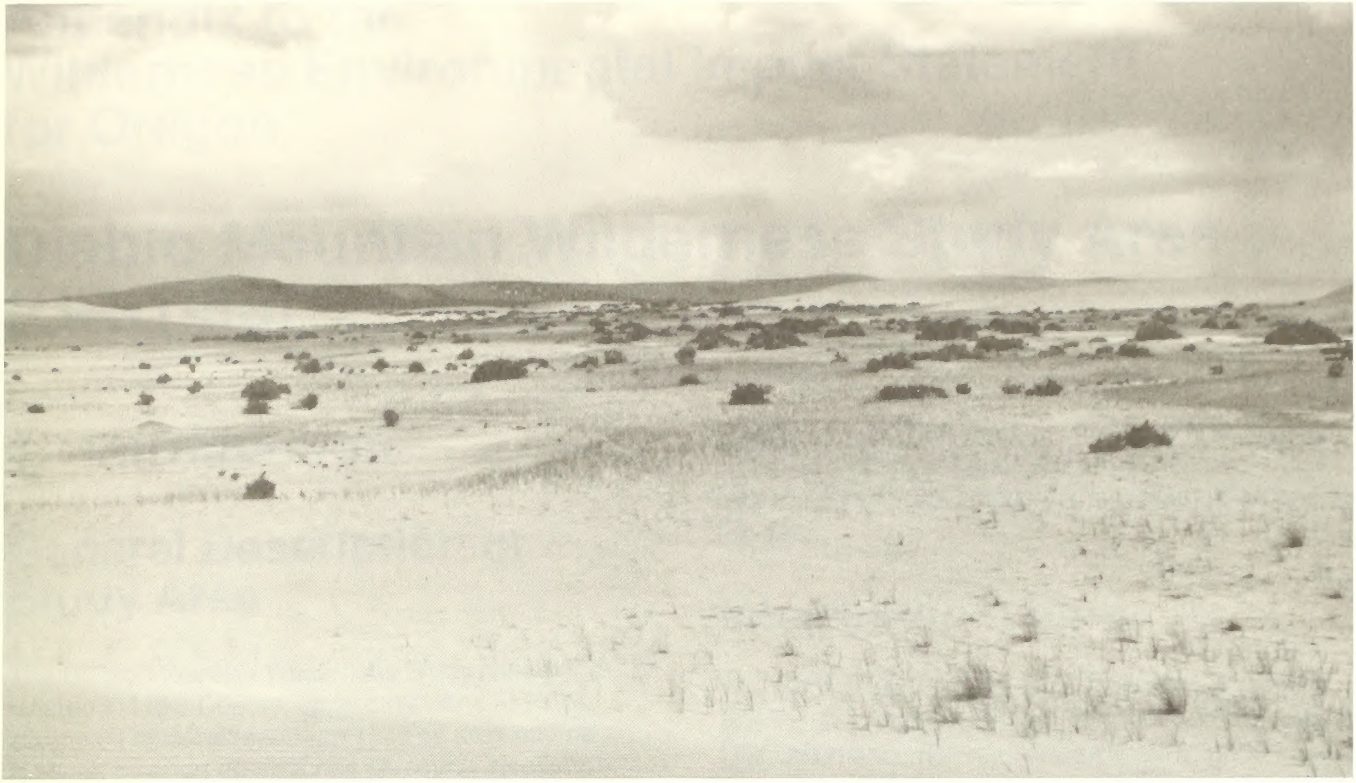
Sand Dunes WSA
OR-1-24

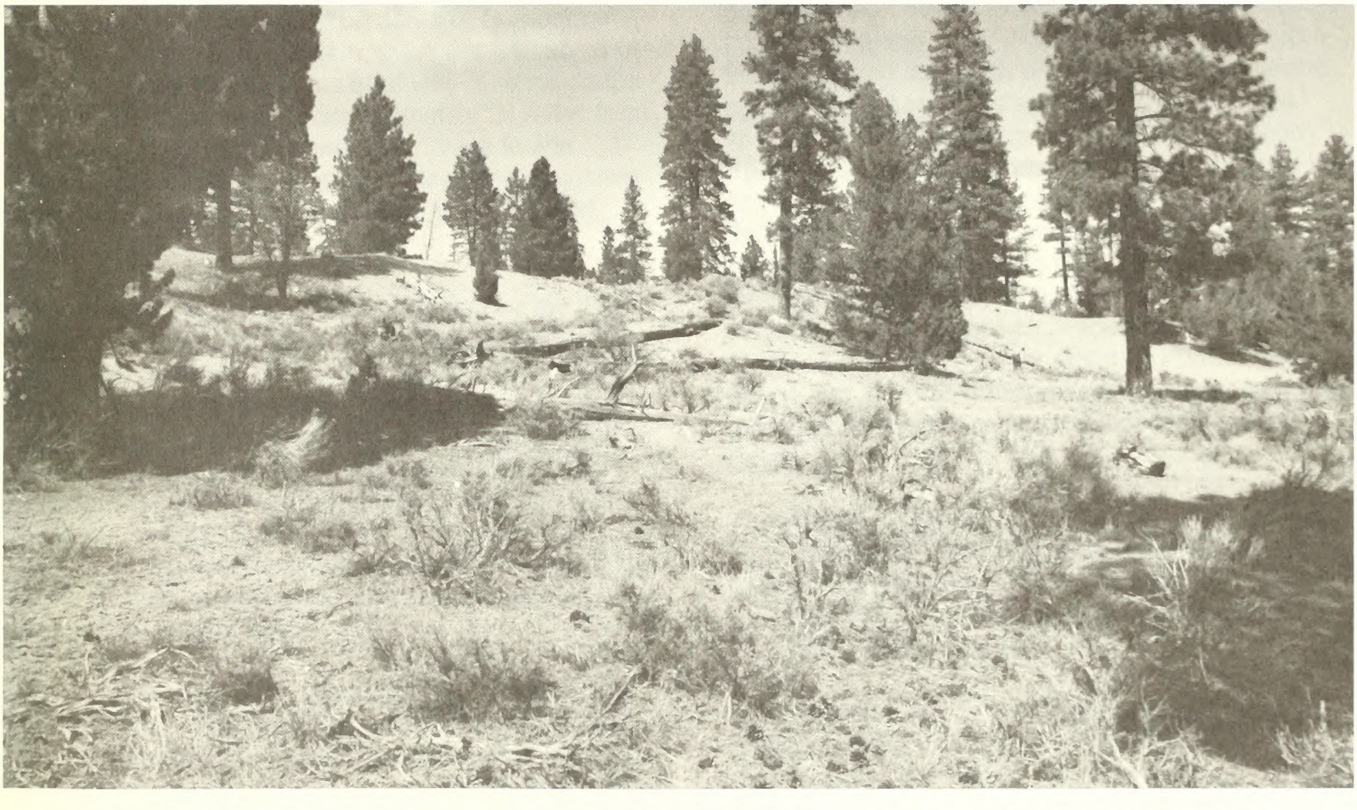
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Sand Dunes WSA, OR-1-24. Near Sand Dunes Well looking south into the sand dunes. Recommended nonsuitable under the proposed action (no wilderness/no action). Illustrates sparse vegetation between sand dunes. June 1982.



Sand Dunes WSA, OR-1-24. In Lost Forest (ISA) portion of the WSA. Within area recommended nonsuitable under the proposed action (no wilderness/no action). Illustrates ponderosa pine and juniper cover in the northern portion of the WSA. July 1982.

[illegible]

[illegible]

Appendix to the Wilderness Environmental Impact Statement for Oregon

Diablo Mountain Wilderness Study Area (OR-1-58)

1. Introduction

General Description of Study Area

The Diablo Mountain Wilderness Study Area (WSA) is located in Lake County, approximately 110 miles southeast of Bend (see Map 1). The area can be reached by short approaches on county roads from Oregon State Highway 31. The south end of the WSA is 5 miles northwest of the small town of Paisley.

The WSA contains 113,120 acres of public land, including approximately 5,200 acres of split-estate land (see Map 2). In addition, there are 640 acres of State land, and 1,170 acres of private land inside the WSA. The study area is approximately 24 miles from north to south and 15 miles wide. There is one narrow spur 4 miles long and 2 miles wide projecting from the main body of the WSA on the southeast corner of the area.

The boundaries of the WSA are defined by the medial line of Summer Lake on most of the west side of the WSA, private lands on part of the south and north sides, low standard BLM dirt roads on the east and south, and the boundary of the Summer Lake State Game Management Area on the northwest. A high standard BLM dirt road forms a portion of the north boundary around Sand Canyon and across to Coyote waterhole. Several parcels of private land project into the north-central part of the area and are almost surrounded by the WSA.

The western half of the WSA has low, rolling terrain and salt flats on the playa adjacent to Summer Lake. The eastern half of the WSA contains several long north-to-south ridges, rising in elevation to the summit ridge of Diablo Mountain. The eastern edge of the WSA is the steep scarp of Diablo, which drops some 1,500 to 2,000 feet to the lands to the east. The WSA contains a transition from salt flats on the far west to salt desert shrub communities in the central portion, with sagebrush/grasslands in the higher elevations on the east.

Interrelationships

The WSA is within the Oregon Department of Fish and Wildlife (ODFW) Wagontire Wildlife Management Unit which encompasses approximately 3,033 square miles. The WSA represents approximately 6 percent of the area in the unit and supports approximately 50 summer range mule deer. ODFW goals include a ratio of 12 bucks per 100 does and a fawn ratio of 45 per 100 does. The WSA supports approximately 24 head of antelope. ODFW has identified the Diablo Mountain area as a high priority area for the reintroduction of California bighorn sheep, a candidate species for Federal listing under the Endangered Species Act. An environmental assessment has been completed and reviewed by the public with regard to the introduction. Since completion of the E.A., wildlife specialists have concluded that one guzzler will be needed for successful reintroduction. This type of project would be allowed in wilderness due to the changes in habitat brought about by human disturbance and the high wilderness values associated with the return of this extirpated species to its original range.

The goal for nongame wildlife is to maintain populations of naturally occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

The Summer Lake State Game Management Area adjacent to the WSA on the northwest is specifically managed by ODFW as a refuge and controlled hunt area. It receives heavy use during waterfowl hunting season.

The extreme eastern portion of the WSA is in the Paisley Desert wild horse herd management area (HMA).

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping, and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on the areas wilderness values,
- impact on wildlife habitat for mule deer, California bighorn sheep and snowy plover,
- impact on wild horse management (Addressed in Statewide EIS volume)
- impact on private inholdings and adjacent private parcels (the effects of wilderness designation on private lands are addressed in the Statewide EIS volume)
- impact on livestock grazing,
- impact on energy and mineral development, and
- impact on archeologic values in the northwest portion of the WSA. (The archeologic issue is addressed in the Statewide EIS volume)

No other issues specific to this WSA were raised by BLM or the public.

2. Description of Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site condition, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- proposed action
- partial
- no wilderness/no action

All Wilderness

Under the all wilderness alternative, 113,120 acres of public land in the Diablo Mountain WSA would be recommended suitable for wilderness designation (see Map 2). For purposes of analysis, this alternative assumes the State and private inholdings and mineral estate of the split-estate land would not be acquired.

Energy and Mineral Development Actions

Wilderness designation would close 107,920 acres to all appropriations under the mining and mineral leasing laws. The 1,170 acres of private land inholdings and 640 acres of State land would remain open to mineral entry at the landowner's discretion. A total of 5,200 acres of split-estate lands would be open to mineral entry.

Exploration and development would be foregone on approximately 75,000 acres with moderate potential for the occurrence of oil and gas and geothermal energy, and on 250 acres with high potential for the occurrence of geothermal resources (see Map 6). Although 3,200 acres of split estate, 1,140 acres of private land, and 640 acres of State land with moderate potential for the occurrence of oil and gas or geothermal resources would be open to energy exploration and development, none is projected due to the scattered locations of the parcels, the absence of leases, and limited direct evidence to support a costly development program. Casual exploration without development or surface disturbance may occur. One 20-MW powerplant and up to 12 geothermal wells affecting a total of 160 acres would be foregone.

Exploration and development would be foregone on approximately 68,120 acres with moderate potential for the occurrence of limestone and diatomite and 1,440 acres with high potential for the occurrence of limestone (see Map 6). Although 2,000 acres of split estate, 1,140 of private land, and 640 acres of State land with moderate potential for the occurrence of limestone and diatomite would be open to exploration and development, only casual exploration without development or surface disturbance is projected. This is due to the locations of the parcels, the expected quality of these deposits, the common occurrence of similar deposits in other accessible locations, and market conditions. One open pit limestone mine affecting 100 acres and 1 mile of access road would be foregone.

Exploration and development would be foregone on approximately 25,240 acres with moderate potential for sodium, potassium, lithium, and boron (evaporites; see Map 6). Although 200 acres of split estate, 130 of private land, and 640 acres of State land with moderate potential for the occurrence of sodium, potassium, lithium, and boron would be open to exploration and development, available data does not suggest or identify any known economic deposits and these elements are available from established sources. Casual exploration is projected in the form of surface sampling or coring without surface disturbance.

Wildlife Habitat Management Actions

Wildlife habitat would be managed on 113,120 acres to support existing wildlife populations of game and nongame species in accordance with ODFW goals for the wildlife management unit and consistent with BLM's wilderness Management Policy. The primary manner in which available forage to support existing wildlife populations would be managed is through coordination with livestock grazing allotment management.

California bighorn sheep would be reintroduced into the Diablo Mountain area. Reintroduction would require construction of a wildlife guzzler disturbing .01 acre to successfully implement the program and offset changes in the environment brought about by past human activities. The guzzler would be authorized under the BLM Wilderness Management Policy. No other wildlife projects are projected.

The WSA includes nesting habitat for snowy plover, a Federal candidate species for protection under the Endangered Species Act. Snowy plover habitat in the WSA would be inventoried and monitored. Wildlife management actions, potentially including wildlife-directed off-road vehicle closures or limitations, would be determined and implemented based on inventory and monitoring data to ensure compliance with the Endangered Species Act.

Livestock Management Actions

Livestock grazing would remain at the current use level of 588 AUMs and season of use as identified in Table 4 for the portions of the six grazing allotments in the WSA.

Vehicle use for livestock management would be precluded on 32 miles of ways. Livestock management activities, including maintenance on 5 miles of fence, would be conducted on horseback. An exception would be the necessity to bring in heavy equipment approximately once every 10 years to clean out the seven waterholes. Water hauling in the Five Mile Butte allotment would require two trips by truck per day along the south boundary road during the 60 days of licensed use.

Recreation Management Actions

The entire 113,120-acre WSA would be closed to motorized vehicle use, including 32 miles of ways. Current recreational use is estimated to be less than 100 visitor days per year. Most of this current use utilizes vehicles for access into the area via existing ways or focuses on off-highway vehicle use on the Summer Lake playa.

Enhanced Wilderness

Under the enhanced alternative, 113,120 acres of public land would be recommended suitable as wilderness. The 1,170 acres of private inholdings, 640 acres of State inholdings and the mineral estate of 5,200 acres of split-estate lands would be acquired, if the owners are willing, through purchase or exchange. Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 114,930 acres. Boundaries would remain on roads or surface ownership boundaries, generally as described in the General Description of the Study Area (see Map 3).

Energy and Mineral Development Actions

Wilderness designation would close 114,930 acres to all appropriations under the mining and mineral leasing laws. This includes the 5,200 acres of split-estate lands for which the mineral estate would be acquired from willing owners. The 1,170 acres of private land inholdings and 640 acres of State land are also included, assuming acquisition from willing owners.

Exploration and development would be foregone on approximately 79,980 acres with moderate potential for the occurrence of oil and gas and geothermal energy, and on 250 acres with high potential for the occurrence of geothermal resources (see Map 6). The 3,200 acres of split estate, 1,140 acres of private land, and 640 acres of State land with moderate potential for the occurrence of oil and gas or geothermal resources are included in the 79,980 acres. Casual exploration without development or surface disturbance may occur. One 20 MW powerplant and up to 12 geothermal wells affecting a total of 160 acres would be foregone.

Exploration and development would be foregone on approximately 71,900 acres with moderate potential for the occurrence of limestone and diatomite and 1,440 acres with high potential for the occurrence of limestone (see Map 6). The 2,000 acres of split estate, 1,140 of private land, and 640 acres of State land with moderate potential for the occurrence of limestone and diatomite are included in the 71,900 acres. Only casual exploration without development or surface disturbance is projected. One open pit limestone mine affecting 100 acres and 1 mile of access road would be foregone.

Exploration and development would be foregone on approximately 26,210 acres with moderate potential for sodium, potassium, lithium, and boron (see Map 6). The 200 acres of split estate, 130 of private land, and 640 acres of State land with moderate potential for the occurrence of sodium, potassium, lithium, and boron are included in the 26,210 acres. Casual exploration is projected in the form of surface sampling or coring without surface disturbance.

Wildlife Habitat Management Actions

Wildlife habitat would be managed on 114,930 acres to support existing wildlife populations of game and nongame species in accordance with ODFW goals and consistent with BLM Wilderness Management Policy. The primary manner in which available forage to support existing wildlife populations would be managed is through coordination with livestock grazing allotment management.

California bighorn sheep would be reintroduced into the Diablo Mountain area. Reintroduction would require construction of a wildlife guzzler disturbing .01 acre to successfully implement the program and offset changes in the environment brought about by past human activities. The guzzler would be authorized under the BLM Wilderness Management Policy. No other wildlife projects are projected.

Snowy plover habitat in the WSA would be inventoried and monitored. Wildlife management actions, potentially including wildlife directed off road vehicle closures or limitations, would be determined and implemented based on inventory and monitoring data to ensure compliance with the Endangered Species Act.

Livestock Management Actions

Livestock grazing would remain at the current use level of 588 AUMs and seasons of use as shown in Table 4. Vehicle use for livestock management would be precluded on 32 miles of ways except for the use of heavy equipment approximately once every 10 years to maintain seven waterholes. Livestock management, including maintenance on 5 miles of fence, would be accomplished by horseback. Water hauling in the Five Mile Butte allotment would require two trips by truck per day along the south boundary road during the 60 days of licensed use.

Recreation Management Actions

The entire 114,930 acres would be closed to motorized vehicle use, including 32 miles of ways. Current recreation visitor use is estimated to be less than 100 visitor days per year.

Proposed Action

Under the proposed action alternative, 85,150 acres would be recommended as suitable for wilderness. In addition, 320 acres of private inholdings and 4,900 acres of mineral estate on split estate land would be acquired from willing owners through purchase or exchange. The proposed action for the Diablo Mountain WSA was developed in response to public comments addressing wilderness values on the west side of the WSA, and to accommodate management objectives for minerals and livestock. This proposed action differs from the partial alternative addressed as the proposed action in the Draft EIS. This alternative increases the suitable recommendation by 34,300 acres over the partial alternative.

Nonsuitable acreage totals some 27,970 acres. Approximately 5,600 acres are recommended nonsuitable on the southeast corner of the WSA where a narrow spur of land projects into lands intensely managed for livestock. The surrounding lands were seeded and developed as a part of the Sharptop fire rehabilitation. A portion of the WSA west of the original partial alternative boundary was added which includes the proposed acquisition of 320 acres of private inholdings.

The boundaries of the area recommended suitable are defined by a low standard BLM road on the east, a combination of BLM roads and legal subdivisions on the northwest and south, and legal subdivisions and the meander line of Summer Lake on the west (see Map 5).

Energy and Mineral Development Actions

Wilderness designation would close 85,150 acres to all appropriations under the mining and mineral leasing laws, assuming acquisition of the current 320-acre private inholding and the mineral estate of the 4,900 acres of split-estate land. The 27,970 acres not designated, including 300 acres of split estate land, would be open to exploration and development. In addition, 850 acres of private land and 640 acres of State land would be open to exploration and development at the landowner's discretion.

Exploration and development would be foregone on approximately 50,550 acres with moderate potential for the occurrence of oil and gas and geothermal energy, including acquired lands (see Map 6). Casual exploration without development or surface disturbance may occur.

About 27,970 acres of public land (including 300 acres of split estate), 820 acres of private land, and 640 acres of State land with moderate potential for the occurrence of oil and gas and geothermal energy would be open to exploration and development. The 250 acres with high potential for the occurrence of geothermal resources would also be open. Geothermal development consisting of one 20 MW power plant and 6-12 geothermal wells would take place on the 250 acres possessing high potential for geothermal resources. Direct disturbance would encompass 160 acres. No other exploration or development is projected due to the scattered locations of the parcels, the absence of leases, and limited direct evidence to support a more extensive development program to include oil and gas.

Exploration and development would be foregone on approximately 42,470 acres with moderate potential for the occurrence of limestone and diatomite and 1,440 acres with high potential for the occurrence of limestone (see Map 6). Although 300 acres of split estate, 820 of private land, and 640 acres of State land with moderate potential for the occurrence of limestone and diatomite would be open to exploration and development, only casual exploration without development or surface disturbance is projected. This is due to the locations of the parcels, the expected quality of these deposits, the common occurrence of similar deposits in other accessible locations, and market conditions. One open pit limestone mine affecting 100 acres and 1 mile of access road would be foregone.

Exploration and development would be foregone on approximately 5,200 acres with moderate potential for sodium, potassium, lithium, and boron (called evaporites; see Map 6). Although 20,040 acres of public land (including 200 acres of split estate), 130 of private land, and 640 acres of State land with moderate potential for the occurrence of evaporites would be open to exploration and development, available data does not suggest or identify any known economic deposits and these elements are available from established sources. Casual exploration is projected in the form of surface sampling or coring without surface disturbance.

Wildlife Habitat Management Actions

Habitat would be managed within the 85,150-acre area designated wilderness to support ODFW goals for existing game and nongame wildlife populations and consistent with BLM's Wilderness Management Policy. The primary manner in which available forage to support existing wildlife populations in the WSA would be managed is through coordination with livestock grazing allotment management.

California bighorn sheep would be reintroduced into the WSA to support the return of this extirpated species to much of its original range. One guzzler, disturbing .01 acre, would be allowed in the portion of the WSA recommended as suitable in order to successfully implement the program and offset changes in the environment brought about by past human activities. The guzzler would be authorized under the BLM Wilderness Management Policy. No other wildlife projects are projected.

The 27,970-acre area recommended nonsuitable includes nesting habitat for snowy plover, a Federal candidate species for protection under the Endangered Species Act. Snowy plover habitat in the WSA would be inventoried and monitored. Wildlife management actions, potentially including wildlife directed off-road vehicle closures or limitations, would be determined and implemented based on inventory and monitoring data to ensure compliance with the Endangered Species Act.

Habitat on the 27,970-acre area recommended nonsuitable would be managed to support ODFW goals for existing game and nongame wildlife populations.

Livestock Management Actions

Livestock grazing use would continue at the current level of 588 AUM's and seasons of use as identified in Table 4. Vehicle use for day-to-day livestock management on 32 miles of ways would be precluded and management in the suitable portion, including maintenance of 5 miles of fence, would be accomplished by horseback. Heavy equipment would be used on approximately a 10-year cycle to maintain the seven reservoirs in the area. The 5,600 acres found nonsuitable on the southeast corner of the WSA is surrounded on three sides by crested wheatgrass seedings and intensive grazing management. The remaining untreated burned area (about 5,000 of the 5,600 acres) from the Sharptop fire would be seeded to improve livestock forage and consolidate the management regimen within this pasture.

Recreation Management Actions

The entire 85,150 acres in the suitable portion would be closed to motorized vehicle use, including 32 miles of ways. Current recreation visitor use is estimated to be less than 100 visitor days per year. Most of this current use utilizes vehicles for access into the area via existing ways.

Partial

Under the partial alternative, 51,160 acres of the WSA would be recommended suitable as wilderness. The mineral estate of 3,680 acres of split-estate lands within the suitable portion of the WSA would be acquired through purchase or exchange from willing owners. There are no State or private inholdings in the area recommended as suitable for wilderness.

Some 61,960 acres would be recommended as nonsuitable for wilderness. Included among the nonsuitable portion would be most of the lands in the WSA with the highest potential for mineral and geothermal development. The partial alternative would place the west boundary of the area recommended suitable along a vehicle way running from the Foster Ranch on the north, to Five Mile Butte on the south. The north half of the west boundary would be formed on legal subdivisions and a low standard BLM road. The remaining boundaries would be formed by low standard dirt BLM roads (see Map 4).

Energy and Mineral Development Actions

Wilderness designation would close 51,160 acres to all appropriations under the mining and mineral leasing laws, assuming acquisition of the mineral estate of the 3,680 acres of split-estate land. The 61,960 acres not designated, including 1,520 acres of split-estate land, would be open to exploration and development. In addition, 1,170 acres of private land and 640 acres of State land would be open to exploration and development at the landowner's discretion.

Exploration and development would be foregone on approximately 26,800 acres with moderate potential for the occurrence of oil and gas and geothermal energy, including acquired lands (see Map 6). Casual exploration without development or surface disturbance may occur.

About 49,840 acres of public land (including 1,520 acres of split estate), 1,140 acres of private land, and 640 acres of State land with moderate potential for the occurrence of oil and gas and geothermal energy would be open to exploration and development. The 250 acres with high potential for the occurrence of geothermal resources would also be open. No oil and gas exploration or development is projected due to the absence of leases and limited direct evidence to support an extensive development program. Exploration would involve geologic mapping, geophysical surveys, and drilling of approximately 20 temperature gradient wells. Geothermal development consisting of one 20-MW power plant and up to 12 geothermal wells would take place on the 250 acres possessing high potential for geothermal resources. Direct disturbance would encompass 160 acres.

Exploration and development would be foregone on approximately 13,970 acres with moderate potential for the occurrence of limestone and diatomite and 1,390 acres with high potential for the occurrence of limestone (see Map 6). Although 54,750 acres of public land (including 1,400 acres of split estate), 1,140 acres of private land, and 640 acres of State land with moderate potential for the occurrence of limestone and diatomite would be open to exploration and development, only casual exploration without development or surface disturbance is projected. About 50 acres of the area with a high potential for the occurrence of limestone would be open to exploration and development, but no exploration or development is projected. No development is projected due to the locations of the parcels, the expected quality of these deposits, the common occurrence of similar deposits in other accessible locations, and market conditions. One open pit limestone mine affecting 100 acres and 1 mile of access road would be foregone.

All 25,240 acres of public land (including 200 acres of split estate), 130 acres of private land, and 640 acres of State land with moderate potential for the occurrence of sodium, potassium, lithium, and boron would be open to exploration and development. Available data does not suggest or identify any known economic deposits and these elements are available from established sources. Casual exploration is projected in the form of surface sampling or coring without surface disturbance.

Wildlife Habitat Management Actions

Habitat would be managed within the 51,160-acre area designated wilderness to support ODFW goals for existing game and nongame wildlife populations and consistent with BLM's Wilderness Management Policy. The primary manner in which available forage to support existing wildlife populations in the WSA would be managed is through coordination with livestock grazing allotment management.

California bighorn sheep would be reintroduced into the WSA to support the return of this extirpated species to much of its original range. One guzzler, disturbing .01 acre, would be allowed in the portion of the WSA recommended as suitable in order to successfully implement the program and offset changes in the environment brought about by past human activities. The guzzler would be authorized under the BLM Wilderness Management Policy. No other wildlife projects are projected.

The 61,960-acre area recommended nonsuitable includes nesting habitat for snowy plover, a Federal candidate species for protection under the Endangered Species Act. Snowy plover habitat in the WSA would be inventoried and monitored. Wildlife management actions, potentially including wildlife-directed off-road vehicle closures or limitations, would be determined and implemented based on inventory and monitoring data to ensure compliance with the Endangered Species Act.

Habitat on the 61,960-acre area recommended nonsuitable would be managed to support ODFW goals for existing game and nongame wildlife populations.

Livestock Management Actions

Livestock grazing would continue at the current 588 AUMs and seasons of use as in Table 4. Eighteen miles of ways in the portion recommended suitable would be closed to vehicle use, except for maintenance of seven waterholes with heavy equipment once every 10 years.

Fourteen miles of vehicle ways in the nonsuitable portion would remain open. Maintenance of 5 miles of fence would be accomplished using vehicles.

Recreation Management Actions

The partial alternative would close 51,160 acres, including 18 miles of ways to recreation vehicles. Fourteen miles of ways and 61,960 acres in the nonsuitable portion would remain open to off-road vehicles, including access to the Summer Lake playa where most vehicle-associated recreation occurs. Recreation use would remain stable at less than 100 visitor days per year.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire 113,120 acres in the WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

The area would be managed according to the current land use plan, which includes continued availability for mineral exploration and development.

Energy and Mineral Development Actions

The entire 113,120 acres, including 5,200 acres of split estate, would be open to mineral entry under this alternative. The 1,170 acres of private land inholdings and 640 acres of State land would also remain open to mineral entry at the landowner's discretion.

The 78,200 acres of public land (including 3,200 acres of split estate) with moderate potential for the occurrence of oil and gas and geothermal energy, and the 250 acres with high potential for the occurrence of geothermal resources (see Map 6) would be open to exploration and development. The 1,140 acres of private land, and 640 acres of State land with moderate potential for the occurrence of oil and gas or geothermal resources would also be open, at the owners' discretion.

Surface-disturbing exploration for oil and gas is not projected due to the absence of leases and limited direct evidence to support a costly development program. Casual exploration without development or surface disturbance, such as geologic mapping and geophysical surveys, may occur. Exploration on the lands with moderate potential would include 20 temperature gradient wells having only short-term physical impacts on less than 10 acres per site. Development of a 20-MW powerplant is projected on the south end of the area on the 250 acres with high geothermal potential, directly impacting 160 acres with the plant and up to 12 production wells.

The 68,000 acres of public land, including 2,000 acres of split estate, with moderate potential for the occurrence of limestone and diatomite and the 1,440 acres with high potential for the occurrence of limestone (see Map 6) would be open to exploration and development. The 1,140 acres of private land and 640 acres of State land with moderate potential for the occurrence of limestone and diatomite would also be open at the owners' discretion. One mine impacting 100 acres and 1 mile of access road is projected for development of this resource.

All 25,240 acres of public land (including 200 acres of split estate), 130 acres of private land, and 640 acres of State land with moderate potential for the occurrence of sodium, potassium, lithium, and boron would be open to exploration and development. Available data does not suggest or identify any known economic deposits and these elements are available from established sources. Casual exploration is projected in the form of surface sampling or coring without surface disturbance.

Wildlife Habitat Management Actions

Habitat would be managed on 113,120 acres to support game and nongame species within ODFW goals. The primary manner in which available forage to support existing wildlife populations would be managed is through coordination with livestock grazing allotment management.

California bighorn sheep would be reintroduced into the WSA to support the return of this extirpated species to much of its original range. One guzzler, disturbing .01 acre, would be allowed to successfully implement the program and offset changes in the environment brought about by past human activities. No other wildlife projects are projected.

Snowy plover habitat in the WSA would be inventoried and monitored. Wildlife management actions, potentially including wildlife-directed off-road vehicle closures or limitations, would be determined and implemented based on inventory and monitoring data to ensure compliance with the Endangered Species Act.

Livestock Management Actions

Current livestock grazing use of approximately 588 AUMs would continue in the WSA. The Sharptop fire rehabilitation did not include forage improvement projects within the WSA. Seeding to provide improved forage would occur on approximately 5,000 acres in the southeast corner of the WSA where such actions were prohibited at the time of the rehabilitation effort.

Vehicle use for livestock management on 32 miles of ways, primarily to check and salt livestock, would continue.

Recreation Management Actions

Visitor use would remain at under 100 visitor days per year. All ways would remain open to vehicle use and the entire 113,120 acres would be open to off-road vehicles.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears to be generally natural. The broad flats along Summer Lake, low dune areas in the lowlands and the draws and ridges of the eastern portion of the area bear only a few minor signs of human activities. Natural processes have masked or removed signs of past activities, such as travel routes, range developments or other structures.

Unnatural features influence less than 1,000 acres. The most noticeable features are the earthwork mounds of seven livestock waterholes located in widely-separated lakebeds in the east half of the WSA. Approximately 5 miles of fence in the southeast corner of the WSA was constructed as part of the Sharptop fire rehabilitation. Located in big sagebrush and rugged topography, it is barely noticeable at even close distances. These developments are substantially unnoticeable in the WSA as a whole, and the topography screens them from view outside of their immediate location.

There are some 32 miles of vehicle ways inside the WSA. Approximately 7 miles of these ways are well-used and visible along their course, but difficult to see from off the ways. The remaining 25 miles are barely used, if at all, and in some cases are very difficult to find. The overall effect of these ways on the area's naturalness is negligible because of their condition and dispersion over a large area.

Approximately 5,600 acres south of Sharptop Peak in the WSA burned in August, 1983. As part of the rehabilitation of the burned area, ryegrass was aerially seeded on about 1,000 acres inside the WSA to stabilize soils. The ryegrass has died out and become unnoticeable in the area. The rehabilitation project has not resulted in any substantially noticeable impact to wilderness resources in the WSA as a whole.

Developments outside the area do not affect a visitor's perception of the area's naturalness.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The large size and the topography within the WSA substantially enhance a visitor's ability to experience solitude at all locations, except within a narrow fringe within a mile of Highway 31 on the south boundary. The draws and broken ridges within the WSA from Sharptop to the peak of Diablo Mountain are particularly effective in isolating the visitor and ensure outstanding opportunities for solitude.

Water hauling to Five Mile Butte Allotment along a boundary road in the southeast of the WSA diminishes opportunities for solitude for 60 days per year. Other activities outside the WSA do not substantially affect opportunities for solitude in most of the WSA.

Outstanding primitive recreation opportunities are widely dispersed across this WSA. Diverse and broken terrain for hiking and backpacking occurs along the eastern half of the WSA in the draws and mountain areas. Wild horses can often be seen in this portion of the study area and deer, antelope, and raptors provide opportunity for wildlife observation. Unique photographic opportunities are found near Sand Canyon and across the western portion of the WSA including the playa, as well as the more mountainous terrain to the east and south. The harsh environs of Diablo WSA present the opportunity to study rugged natural communities which survive beyond the influence of human capacities to alter or redefine the natural environment.

Special Features

Fossil mollusks have been found in sedimentary deposits around the Ten Mile Butte area, and there are suspected to be more fossils in the sedimentary rocks in the western two-thirds of the WSA. Archeologic sites are located within the WSA and there are also more recent homesteads of historic interest in the northern portion of the WSA.

The area has been selected by the ODFW for reintroduction of California bighorn sheep, a candidate species for Federal listing under the Endangered Species Act. The rims on the east side of the WSA are also used by raptors for nesting, and the eastern shore of Summer Lake is potential nesting habitat for the snowy plover, another Federal candidate species.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and the potential natural vegetation is saltbush-greasewood and sagebrush steppe. The study area contains seven vegetative communtities listed in the Basin and Range section of the Oregon Natural Heritage Plan: big sagebrush/bluebunch wheatgrass; big sagebrush-greasewood; low sagebrush/Sandberg's bluegrass; bare playa and playa margin; big sagebrush-spiny hopsage; greasewood-saltgrass and shadscale-spiny hopsage-budsage. The dispersal of the communities from east to west in a transition pattern from type to type adds special interest to the WSA with relation to the vegetative representation.

The WSA is within five hours' driving time of four standard metropolitan statistical areas with population over 100,000: Medford, Salem, and Eugene/Springfield, Oregon, and Redding, California.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and data provided in a report titled "Assessment of Geology, Energy, and Mineral Resources of the Summer Lake Geologic Resource Area" prepared by TERRADATA, a consulting firm under contract with BLM. The WSA is within the Summer Lake geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence of certain minerals, as well as the quantity and quality of data on which the rating is based (certainty level). A description of the rating system is provided in the Statewide EIS volume.

A 1986 U.S. Bureau of Mines study of 51,160 acres in the Diablo Mountain WSA reports no mineral resources identified; also there are no mines, no active prospects, claims, or mineralized areas existing in or adjacent to the portion of the study area initially recommended suitable for wilderness (partial alternative). Field studies conducted in June, 1988 will provide additional information relative to potential for mineral development in the west half of the WSA, including the portion added to the partial alternative in the Draft EIS to complete the suitable recommendation in the current proposed action.

Table 3 gives the mineral potential classifications for the WSA. Map 6 shows the portions of the WSA rated high for geothermal and limestone and rated moderate for evaporites, oil and gas, geothermal, diatomite and limestone.

The surface of the WSA is characterized by Tertiary continental volcanic rocks and volcanic-related sediments, and Tertiary to Quaternary lacustrine (lake), fluvial (stream), and eolian (wind-blown) sedimentary deposits. Geology of the subsurface is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

The main potential energy resources in the WSA appear to be geothermal and oil and gas.

Some 250 acres in the southern end of the study area are within the Summer Lake Known Geothermal Resource Area (KGRA), a Federally defined area with specific boundaries within which geothermal resources are known to exist. The potential for occurrence of geothermal energy is rated high for this portion of the WSA. Based on indirect evidence, the western two-thirds of the WSA is rated moderately favorable for geothermal energy.

Because of the possibility of oil and gas bearing rocks at depth, and some gas show in water wells, there also appears to be moderate potential for oil and gas in the western two-thirds of the WSA. As of October 16, 1987, there were no oil and gas or geothermal leases in the WSA.

Mineral Resources

Based on indirect evidence, the portion of the WSA in and immediately adjacent to Summer Lake lakebed is rated moderately favorable for the occurrence of sodium, potassium, lithium and borates. About 1,440 acres around the Ten Mile Butte area are rated as having high favorability for the occurrence of limestone based on direct evidence. However, the limestone in this area is a lacustrine (lake) deposit contaminated with clay, sand and organic material. Limestone in the WSA is not of adequate quality for cement of metallurgical uses. The western two-thirds of the WSA is rated as moderately favorable for limestone and diatomite.

Known mineral deposits within the WSA are rock aggregate sites (used for road construction) at the south end of the WSA, and a low grade limestone deposit near Ten Mile Butte.

There were no mining claims in the WSA as of October 16, 1987.

Vegetation

The Summer Lake Basin vegetation, on the west side of the WSA, is typical salt-desert shrub communities of mainly black greasewood with spiny hopsage, shadscale, budsage, spiny horsebrush, big sagebrush and gray rabbitbrush. Great Basin wildrye, Indian ricegrass and squirreltail occur on the sand dunes and hummocks. Desert saltgrass occurs throughout the basin, becoming quite abundant in the area surrounding barren playas and where alkali is thick.

Wildflowers are common in the salt-desert shrub community. Smooth malocothrix and desert paintbrush commonly occur and add vivid yellow and red colors to the understory. Other wildflowers are: eriastrum, hairy evening primrose, carved-seed, plagiobothrys, thelypody, showy townsendia, cushion buckwheat and milkvetch.

Vegetation on the uplands to the east of the basin is different than what would be normally expected. Blowing alkali sands over the centuries have influenced the soils and vegetation in the surrounding uplands. Salt-desert shrub communities, which are generally restricted to basins, occur throughout the Diablo Mountain WSA, wherever the prevailing winds have carried the alkali dust and sand. Wildflowers on the uplands include cushion buckwheat, desert paintbrush, death-camas and larkspur.

The salt-desert shrub community (greasewood, spiny hopsage, shadscale, budsage and horsebrush) forms mosaic patterns with big sagebrush and cheatgrass communities throughout the uplands of the WSA. The differences in size, color and species, and the dominance of shrubs, form the basis of the mosaic pattern and give subtle texture to the landscape. Transition areas from the basin to the uplands are noticeable along the north slope of the WSA.

The typical salt-desert shrub community can be observed grading into greasewood-big sagebrush/cheatgrass with some spiny hopsage and shadscale to big sagebrush/cheatgrass to shadscale/poa communities.

The salt-desert shrub community in the basin is in good condition and is an excellent representative of this major community type. This same community in the uplands is quite unusual and shows the long-term influence of the drying of Summer Lake and its effect on the surrounding area. The plant communities in the area vary from mid-seral to potential natural community.

There are no known locations of threatened or endangered plant species within the WSA.

Wildlife

A variety of game and nongame species inhabit or frequent the WSA, including; antelope (approximately 24 head), mule deer (30-50), coyotes, rabbits and other small animals. Lack of water in the area limits available habitat and consequent animal numbers for most species.

The rims on the east side of the WSA are used by prairie falcons, red-tailed hawk, golden eagle and other raptors. Other birds include raven, chukar, California quail, avocets, killdeer, canyon wren, sage sparrow, and sage thrasher. Reptiles in the area include the western rattlesnake and various lizards.

The WSA includes nesting habitat for snowy plover, a Federal candidate species for protection under the Endangered Species Act. The species was recently identified in the WSA and inventories have not been completed to determine the extent the WSA is used. Endangered species management is ongoing to guard against adverse impacts to habitat.

Diablo Mountain WSA is a primary location identified by ODFW reintroduction of California bighorn sheep.

Watershed

There are no perennial springs or streams in the WSA.

Livestock Grazing

The WSA provides 588 AUMs of livestock forage in portions of six grazing allotments. AUMs and seasons of use are displayed in Table 4. Existing livestock projects in the WSA include seven waterholes and 5 miles of fence in the southeast corner of the WSA constructed for pasture management to separate native rangeland from the Sharptop fire rehabilitation seeding.

Current livestock management involves only rare vehicle use inside the WSA on limited portions of the 32 miles of existing ways. Most cattle operations use horses within the WSA for livestock management activities, including fence maintenance. Waterhole maintenance requires heavy-equipment access approximately once every 10 years.

Recreation Use

The primary recreation activity in the WSA is related to hunting and limited off-road vehicle use on the playa east of Summer Lake. Vehicle-oriented recreation occurs throughout most of the year. Trapping occurs in winter in the WSA but is limited to existing ways.

Evidence of recreation use, such as vehicle tracks and observed use, indicates rather low levels of nonprimitive recreation use. Primitive recreation use is also fairly limited in the WSA. Total use in the WSA is estimated at less than 100 visitor days per year. Correspondence received by BLM's Lakeview District indicates the area is used occasionally for camping and backpacking, mostly on the east side and north end of the WSA.

Local Personal Income

Livestock use at the current level of 588 AUMs and recreation use totaling less that 100 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $7,000 for livestock grazing and approximately $1,000 from recreation use, for an overall total of $8,000. The Statewide volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in the Diablo Mountain WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 113,120 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and wilderness values within the entire 113,120 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features such as the habitat for California bighorn sheep, snowy plover, archeological resources and fossils would also be preserved.

Naturalness

The natural conditions would be enhanced under this alternative by prohibiting vehicle use or other actions which would cause substantial alteration of ecosystems or landforms by human activities. The terrain and vegetative transition from alkali flats to rolling vegetated dunes, then eastward into saltbrush flats blending to low hills, and finally the sage communities along the broken rims and convoluted draws of the Diablo Mountain uplift would be preserved as an example of the natural diversity and complexity of desert ecosystems. Closure of 32 miles of ways within the WSA would allow for revegetation to occur and natural processes to control landform, soil distribution and watershed patterns within the drainages and outwash plains of the WSA, thus protecting natural conditions in the area. Closure would directly eliminate the unnatural influence of the ways on approximately 40 acres where the visual influence is essentially limited to the views along the course of the ways.

Approximately 9 miles of ways would continue to receive use from heavy equipment for maintenance of seven waterholes approximately once every 10 years. This infrequent use would not prevent revegetation of the ways. Construction of a guzzler to support bighorn sheep reintroduction would disturb .01 acre and would be designed to blend with surrounding terrain, having a visual impact on fewer than 20 acres.

Solitude

Opportunities for solitude provided by the area's large size, terrain and limited vehicle access would be further enhanced by the elimination of motorized use on 32 miles of ways. This alternative would preserve the area's setting and outstanding opportunities for solitude and scenic vistas of the Summer Lake Basin, Winter Ridge and the high desert country to the east of the wilderness. There would be a temporary disruption of opportunities for solitude during the infrequent and brief periods associated with waterhole maintenance every 10 years. Daily water hauling into the Five-Mile Butte allotment along the boundary road would cause disturbance to solitude in the southeast corner of the area.

Primitive and Unconfined Recreation

Closure of the 32 miles of ways to motorized use would increase opportunities for primitive and unconfined recreation such as hiking, backpacking, camping and horseback riding. The quality of hunting, photography, wildlife observation and sightseeing experiences would improve with the removal of vehicles and the rehabilitation of ways. A more natural primitive setting would be provided. The introduction of bighorn sheep into the area would provide an additional feature for improved recreational opportunities.

Special Features

Closure of ways to vehicle access would enhance the suitability of the area for bighorn sheep reintroduction. The elimination of off-road vehicles along the eastern shore of Summer Lake would eliminate a potential threat to snowy plover nesting habitat. Fossil deposits and archeologic sites would also receive added protection with elimination of direct physical impacts on the resource from vehicles and with control of vehicle access thereby limiting the ability to disturb or remove site materials.

Conclusion: Wilderness designation of the entire 113,120 acres within the Diablo Mountain WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 107,920 acres to all appropriations under the mining and mineral leasing laws. The 5,200 acres of split-estate land, 1,170 acres of private land, and 640 acres of State land would remain open to mineral exploration.

Energy Development

Exploration and development on approximately 75,000 acres rated moderate and 250 acres rated high for geothermal resources would be precluded. Development of a 20-MW powerplant and 6 to 12 production wells on the 250 acres within the KGRA would not occur. Exploration including the drilling of approximately 20 temperature gradient wells would be foregone. While the 5,200 acres of split-estate land, 1,140 acres of private land, and 640 acres of State land would remain open to energy exploration and development, the scattered location of the tracts, limited potential, or limited level of certainty for occurrence, lead to a projection of no development.

Conclusion: Wilderness designation would preclude geothermal resource development. Electrical power production from one 20-MW power plant would be foregone.

Mineral Development

The 68,120 acres with moderate potential for limestone and diatomite would be closed to mineral entry, as would the 1,440 acres with high potential for limestone. Exploration and development of one mine and one mile of road, directly affecting 100 acres, would be precluded. Due to scattered nature of the split-estate mineral tracts, potential based on indirect evidence and market conditions, development is not projected on the split-estate mineral lands.

Conclusion: Wilderness designation would preclude projected development of one 100-acre limestone mine.

Impacts to Vegetation

Vegetative composition and ecological status as described in the vegetation section of the affected environment would not be changed. The 32 miles of ways, once closed to vehicles, would revegetate within approximately five growing seasons. Portions of the WSA would remain in mid-seral stage, while areas with salt tolerant species would remain in potential natural communities.

Conclusion: Thirty-two miles of ways would revegetate, affecting 32 acres. No further change in vegetation is projected.

Impacts on Wildlife

Wildlife habitat on 113,120 acres for 50 mule deer, 24 antelope, raptors, and to support reintroduction of California bighorn sheep would be maintained under wilderness designation. Adequate wildlife forage would be ensured in the preparation of livestock allotment management plans to support ODFW population goals.

Bighorn sheep habitat would be enhanced by the exclusion of vehicles resulting from wilderness designation. One guzzler would be constructed to provide water for the sheep reintroduction due to the past alteration of the natural environment by human activities.

Snowy plover nesting habitat would be enhanced by eliminating potential conflicts such as off-road vehicle use. Raptor nesting areas on the rim would also receive protection from surface-disturbing activities or encroachment by vehicle use.

Conclusion: Wildlife habitat on 113,120 acres would be maintained or enhanced under wilderness designation.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of 588 AUMs in the WSA. Vehicle use on 32 miles of ways within the study area would be eliminated, except for heavy equipment access on 9 miles of ways for waterhole maintenance once every 10 years. Livestock-management activities within the WSA would be conducted on horseback. Water would be hauled by truck along the south boundary road twice daily for the 60 days of licensed use for the Five Mile Butte allotment. Forage enhancement on 5,000 acres remaining untreated after the Sharptop fire would be foregone.

Conclusion: Forage enhancement on 5,000 acres would be foregone and vehicle use on 32 miles of ways would be eliminated except for heavy equipment access on 9 miles of way for waterhole maintenance once every 10 years.

Impacts on Recreation Use

The entire 113,120 acres would be closed to motorized traffic for recreation under this alternative. This would not alter recreational use within the WSA, presently at less than 100 visitor days per year. Primitive recreation use would be expected to increase slightly, offsetting displaced vehicle-oriented activity.

Conclusion: No change in the use level of less than 100 visitor days per year would occur, although there would be a shift to primitive recreation.

Impacts on Local Personal Income

Livestock grazing would remain at 588 AUMs and recreation use is expected to remain at less than 100 visitor days per year, resulting in no net change in local personal income. Table 5 shows the effects on local personal income generated from these activities.

Conclusion: Annual local personal income generated from resource outputs would remain at approximately $8,000.

Enhanced Wilderness

Recommended suitable for wilderness: 114,930 acres (assuming 1,170 acres of private and 640 acres of State inholdings are acquired).

Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The enhanced wilderness alternative would add 114,930 acres to the NWPS, assuming the 1,810 acres of State and private inholdings are acquired as proposed under this alternative. The mineral estate of 5,200 acres of split-estate lands would also be acquired. Thirty-two miles of vehicle ways would be closed. Wilderness values of naturalness, solitude, primitive and unconfined recreation would be protected by legislative mandate. Special features, including fossils and habitat for bighorn sheep, would also be protected.

Naturalness

The effects on naturalness would be similar to the all wilderness alternative except that this enhanced wilderness alternative includes acquisition of the mineral estate of ten parcels (5,200 acres) of split-estate lands scattered over the entire WSA, and four private and State inholdings (1,810 acres) primarily located along the centerline of the WSA. Acquisition and subsequent wilderness management would preclude vehicle access and other physical disturbance associated with nonprimitive recreation use and casual mineral exploration, thus preserving the naturalness of the area.

Closing 32 miles of ways would allow revegetation and eliminate their unnatural influence on approximately 32 acres. Approximately 9 miles of ways would continue to receive use from heavy equipment for maintenance of seven waterholes approximately once every 10 years. This infrequent use would not prevent revegetation of the ways. Construction of a guzzler to support bighorn sheep reintroduction would disturb 0.01 acre and be designed to blend with surrounding terrain, visually impacting fewer than 20 acres.

Solitude

The effects on solitude would be similar to the all wilderness alternative, with opportunities for solitude enhanced by the acquisition of private and State inholdings and mineral estate. Solitude on the 114,930 acres suitable for wilderness under this alternative would be enhanced by the elimination of vehicle traffic for mineral or energy exploration within the entire WSA. Periodic short-term impacts to the opportunity for solitude would occur as a result of waterhole maintenance every 10 years. Daily water hauling into the Five-Mile Butte allotment would impact solitude in the southeast corner of the WSA with vehicle noise and presence along the boundary road.

Primitive and Unconfined Recreation

The same increased opportunities for primitive and unconfined recreation resulting from closure of 32 miles of ways identified under the all wilderness alternative would occur under this alternative. In addition, acquisition would preclude mineral exploration activities on inholdings or split mineral estate thus enhancing a natural setting for primitive recreational pursuits. Primitive recreation use would be expected to increase slightly, with total recreation use remaining at less than 100 visitor days per year.

Special Features

The enhanced alternative would protect such special features within the WSA as archeologic and paleontologic resources, California bighorn sheep habitat, and snowy plover and raptor nesting habitat.

Conclusion: Wilderness designation of 114,930 acres would protect and enhance the existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 114,930 acres to all appropriations under the mining and mineral leasing laws, assuming the 1,170 acres of private land, 640 acres of State land, and mineral estate of 5,200 acres of split-estate lands are acquired.

Energy Development

Exploration and development on approximately 79,980 acres rated moderate and 250 acres rated high for geothermal resources would be precluded. If private and State inholdings and mineral estate of split-estate lands were acquired, another 4,980 acres with moderate potential for the occurrence of oil and gas or geothermal resources would be closed to energy exploration and development. Projected development of a 20-MW power plant and 6 to 12 production wells on the 250 acres with high geothermal potential would not be allowed. Exploration including the drilling of approximately 20 temperature gradient wells would be foregone.

Conclusion: Wilderness designation would preclude a projected 20-MW power plant, up to 12 production wells, and further exploration for energy resources.

Mineral Development

About 71,920 acres with moderate potential for limestone and diatomite would be closed to mineral entry, as would the 1,440 acres with high potential for limestone. Exploration and development of one mine and one mile of road, directly affecting 100 acres, would be precluded.

Conclusion: Development of one limestone mine would be foregone.

Impacts on Vegetation

The impacts on vegetation under the enhanced wilderness alternative would be the preservation of existing plant communities, with portions of the WSA in mid-seral stage, and the majority of the areas containing salt-tolerant species in potential natural communities. Existing vehicle ways would revegetate with native species on approximately 32 acres within approximately five growing seasons. Vegetative composition as described in the vegetation section in the Affected Environment would not change.

Conclusion: Thirty-two miles of way would be closed, with 32 acres revegetating with native species. Little change would occur on the remainder of the area.

Impacts on Wildlife

The enhanced alternative would result in many of the same environmental consequences as the all wilderness alternative. Wildlife habitat for the approximately 50 mule deer, 24 antelope and the area's nongame species would be maintained under the enhanced wilderness designation. Adequate wildlife forage would be ensured in the preparation of livestock allotment management plan goals. Bighorn sheep reestablishment would be encouraged by the closure of the area to vehicles and acquisition of mineral interest on 5,200 acres of split-estate lands thereby eliminating potential conflicting uses within bighorn habitat. The construction of a wildlife guzzler to facilitate the reintroduction would be allowed due to the past alteration of the natural environment by human activities.

Snowy plover nesting habitat would be enhanced by eliminating potential conflicts such as off-road vehicle use. Raptor nesting areas on the rim would also receive protection from surface-disturbing activities or encroachment by vehicle use.

Conclusion: Wildlife habitat and populations would be preserved or enhanced on 114,930 acres.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of approximately 588 AUMs in the WSA. Vehicle use on 32 miles of ways within the study area would be eliminated. Vehicles could not be used to haul salt or maintain fence. Forage enhancement on the 5,000 acres untreated after the Sharptop fire would be forgone.

Conclusion: Livestock grazing would continue at 588 AUMs; forage enhancement on 5,000 acres would be foregone. A minor inconvenience to livestock operators would result from the vehicle closure.

Impacts on Recreation Use

The entire 114,930 acres would be closed to motorized traffic for recreation under this alternative. Recreation use would remain at less than 100 visitor days per year within the WSA as primitive recreation use would be expected to increase slightly, offsetting displaced vehicle-oriented activity.

Conclusion: Recreation use is expected to remain at less than 100 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 588 AUMs and recreation use is expected to remain stable at less that 100 visitor days per year, resulting in no net change in local personal income. Table 5 shows the effects on local personal income generated from activities in the WSA.

Conclusion: Annual local personal income generated from resource outputs would remain at approximately $8,000.

Proposed Action

Recommended suitable for wilderness: 85,150 acres (plus 320 acres of private land if acquired)
Recommended nonsuitable for wilderness: 27,970 acres

Impacts on Wilderness Values

The proposed action alternative would add 85,470 acres to the NWPS, assuming the acquisition of 320 acres of private inholdings and the mineral estate on 4,900 acres of split-estate land. Thirty-two miles of ways would be closed to vehicle travel. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved on 85,470 acres. Special features such as the habitat for bighorn sheep reintroduction and fossils would also be preserved. This alternative was developed with special attention to preservation of snowy plover habitat on the eastern shore of Summer Lake.

Wilderness values on the remaining 27,970 acres would not receive special legislative protection and would be subjected to the effects of such uses as energy exploration and development and motorized recreation use.

Naturalness

The affects on naturalness would be similar to the all wilderness alternative on the 85,470 acres designated wilderness. The terrain and vegetative transition from alkali flats to rolling vegetated dunes, then eastward into saltbrush flats blending to low hills, and finally the broken rims and convoluted draws of the Diablo Mountain uplift, culminating at the dramatic east facing escarpment, would still be preserved as an example of the natural diversity and complexity of desert ecosystems. Closure of 32 miles of ways would allow for revegetation to occur. This would directly eliminate the unnatural influence of the ways on approximately 32 acres. Nine miles of ways would continue to receive use from heavy equipment once every 10 years for maintenance of seven waterholes. This infrequent use would not prevent revegetation of the ways. Construction of a wildlife guzzler would directly impact .01 acre with visual impacts to fewer than 20 acres.

Nonsuitable lands northwest of the main block recommended suitable as wilderness are primarily unsuited to development, and natural conditions would not be expected to change substantially. On the south, lands recommended nonsuitable could be developed for geothermal energy within the 250 acres with high potential, with one 20-MW powerplant and up to 12 production wells directly impacting approximately 160 acres and visually affecting up to approximately 2,000 acres in the immediate environs of development. The 5,600 acres on the southeast corner of the WSA found nonsuitable would be surrounded on three sides by crested wheatgrass seedings and intensive cattle grazing within the allotment. About 5,000 acres would be seeded to enhance forage production.

Solitude

The effects on solitude would be similar to the all wilderness alternative on the 85,470 acres designated wilderness. Opportunities for solitude would still be a function of the area's large size, terrain and vehicle closures retained in the proposed action. This alternative would preserve the area's outstanding opportunities for solitude in the highlands and ridges near Diablo Peak. Substantial opportunities would continue to exist on the saltbrush flats and playa on much of the eastern shore of Summer Lake. Short-term disruption of solitude would occur every 10 years when waterholes are maintained.

Opportunities for solitude would be disturbed in the nonsuitable area on the south by development activities and operations of a geothermal power plant. The noise and various visual and physical impacts associated with the plant would disrupt one's sense of solitude on approximately 2,000 acres. Range development on 5,000 acres would disrupt solitude on a one-time basis and water hauling along the south boundary road would cause daily impacts from vehicle noise and presence for 60 days each year.

Primitive and Unconfined Recreation

Closure of the 32 miles of ways to motorized use, as in the all wilderness alternative, would increase opportunities for primitive and unconfined recreation such as hiking, backpacking, camping and horseback riding. Acquisition of mineral estate of split-estate lands and private inholdings would also enhance opportunities on 85,470 acres by precluding private development actions or mineral exploration which would degrade the esthetic values and natural setting offered under wilderness designation.

On the 27,970 acres recommended nonsuitable, primitive recreation opportunities would be most affected on 2,000 acres near the potential geothermal development. Primitive recreation potential would also be affected by the potential loss of natural character on approximately 5,000 acres recommended nonsuitable in the southeast corner of the WSA where livestock forage enhancement would take place. Both activities would alter the primitive setting.

Special Features

Closure of ways to vehicle access would enhance the suitability of the area for bighorn sheep reintroduction. Protection of snowy plover habitat is a special feature addressed by this alternative in precluding vehicle access to the nesting habitat. Fossil and archeological resource areas would also be protected within the recommended suitable boundary.

Conclusion: Wilderness designation of the 85,470 acres within the Diablo Mountain WSA would protect and enhance existing wilderness values in key areas within the body of the WSA. In the portion not designated as wilderness, projected activities would both directly and indirectly impair wilderness values on approximately 7,000 acres of the WSA.

Impacts on Energy and Mineral Development

Wilderness designation would close 85,470 acres to mineral entry. This assumes acquisition of 4,900 acres of mineral estate of split-estate land and 320 acres of private land.

Energy Development

Exploration and development on 50,550 acres rated moderate for geothermal resources would be precluded. Development of a 20-MW powerplant and up to 12 production wells on the 250 acres with high potential for geothermal resources would occur.

Conclusion: There would be no impact to energy development in the area recommended suitable. Development of one 20-MW powerplant and up to 12 production wells would occur in the nonsuitable portion.

Mineral Development

The 1,440 acres with high potential for limestone would be closed to mineral entry. Approximately 42,470 acres rated moderate for limestone would be closed to mineral entry. Exploration and development of one limestone mine and one mile of road, affecting 100 acres, would be precluded.

Conclusion: Wilderness designation would preclude development of one limestone mine.

Impacts to Vegetation

There would be no substantial change to vegetative composition or ecological status of the mid-seral to potential natural communities as described in the vegetation section of the affected environment on 85,470 acres designated wilderness. Thirty-two acres would revegetate with the closure of 32 miles of ways.

In the 27,970 acres recommended nonsuitable, seedings to enhance forage production would alter vegetation on approximately 5,000 acres within the area burned by the Sharptop fire from native to non-native grass species. Approximately 160 acres of vegetation would be removed or altered by geothermal wells and powerplant development.

Conclusion: In the suitable portion, 32 acres would revegetate with closure of ways with little or no change in vegetation composition or ecological status on other designated areas. In the nonsuitable portion, 5,000 acres would be converted to non-native vegetation and approximately 160 acres of vegetation would be altered or removed.

Impacts on Wildlife

Wildlife habitat for 50 mule deer, 24 antelope, raptors and reintroduction of bighorn sheep would be maintained or enhanced under the proposed action. Adequate wildlife forage would be ensured in the preparation of livestock allotment management plans to support ODFW population goals. One guzzler would be installed to support bighorn sheep reintroduction and provide water for wildlife. Snowy plover habitat along the Summer Lake playa and water margins would be protected.

In the nonsuitable portion, 5,000 acres of native habitat would be converted to non-native species providing early spring forage grasses. Geothermal development would eliminate 160 acres of habitat for deer, antelope and other wildlife species. Protection of snowy plover habitat would be taken into consideration in management actions.

Conclusion: Wildlife habitat and populations would be preserved or enhanced on 85,470 acres. Habitat would be altered on 5,000 acres and lost on an additional 160 acres.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of 588 AUMs in the WSA. Vehicle use on 32 miles of ways within the study area would be eliminated. Minor inconvenience would be caused for livestock operators with the closure of 32 miles of ways. Use of 9 miles of ways would continue once every 10 years to maintain seven waterholes.

In the nonsuitable portion, livestock forage would be enhanced on 5,000 acres by seeding.

Conclusion: Livestock use would remain at 588 AUMs with forage improvement on 5,000 acres.

Impacts on Recreation Use

The 85,470 acres designated wilderness would be closed to motorized traffic for recreation under this alternative. This would not alter recreational use of less than 100 visitor days per year within the WSA as primitive recreation use would be expected to increase slightly, offsetting displaced vehicle-oriented activity.

Conclusion: No change in the recreation use of less than 100 visitor days per year would occur, but there would be a slight shift toward primitive recreation.

Impacts on Local Personal Income

Livestock grazing would remain at 588 AUMs and recreation use would not change from less than 100 visitor days per year. Projected energy development would amount to one 20 MW geothermal power plant with up to 12 production wells, which would increase local personal income by an unknown amount.

Conclusion: Annual local personal income generated from resource outputs would increase by an unknown amount above the current $8,000.

Partial Wilderness

Recommended suitable for wilderness: 51,160 acres
Recommended nonsuitable for wilderness: 61,960 acres

Impacts on Wilderness Values

The partial wilderness alternative would add 51,160 acres to the NWPS. The mineral estate of 3,680 acres of split-estate land would also be acquired. Eighteen miles of ways would be closed and allowed to revegetate. Wilderness values of naturalness, solitude, primitive and unconfined recreation and special features would be preserved on the area recommended suitable.

Wilderness values on the remaining 61,960 acres would not receive special legislative protection and would be subjected to the effects of such uses as energy or mineral exploration and development and motorized recreation use.

Naturalness

Under this alternative, naturalness within the 51,160 acres recommended suitable for wilderness would be preserved by the elimination of motorized traffic on 18 miles of ways, allowing them to revegetate. Maintenance of waterholes in the area would require the use of heavy equipment approximately once every 10 years, although this limited use would not prevent revegetation of the ways. A wildlife guzzler for bighorn sheep would directly impact .01 acre, and indirectly affect fewer than 20 acres.

Naturalness within the 61,960 acres recommended nonsuitable would be adversely affected by the cumulative impacts of continued vehicle use on about 500 acres, and directly affected by geothermal energy development of a 20-MW powerplant and up to 12 geothermal production wells on 160 acres, with indirect impacts affecting approximately 2,000 acres. The drilling of 20 exploration wells would directly impact another 200 acres and visually impact about 6,000 acres.

Solitude

Opportunities for solitude would be preserved within the portion recommended suitable by the elimination of vehicle traffic and the closure of 51,160 acres within the WSA to mineral entry. There would be temporary interruption of solitude every 10 years due to waterhole maintenance. Daily water hauling along the boundary road would continue to degrade opportunities for solitude 60 consecutive days each year.

Opportunities for solitude on the 61,960 acres recommended nonsuitable under this alternative would be diminished on about 500 acres by continued vehicle access. The noise and activities associated with geothermal exploration and development would impact solitude on an additional 8,000 acres.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be preserved within the 51,160 acres recommended suitable, and such opportunities would be enhanced by the closure of 18 miles of ways to vehicle-oriented recreation.

On the 61,960 acres recommended nonsuitable, opportunities for primitive and unconfined recreation would be degraded to a minor degree by the noise and the presence of vehicles, by energy exploration, and by geothermal development in the southern end of the WSA.

Special Features

The known fossil deposits within the area recommended suitable would benefit from the exclusion of vehicles thereby preventing vehicle damage and discouraging any extensive collecting. Bighorn sheep habitat and raptor habitat is contained in the area recommended suitable and would be enhanced by the elimination of vehicles.

Approximately two-thirds of the area with potential for the discovery of fossil invertebrates would be subject to vehicle disturbance and destruction of resources in the area nonsuitable for wilderness.

The area proposed for bighorn sheep reintroduction is within the acreage recommended suitable for wilderness under this alternative, as is the raptor nesting habitat. Snowy plover nesting habitat would not receive wilderness protection under this alternative, as it is entirely within the nonsuitable portion.

Conclusion: The partial alternative would preserve wilderness values on 51,160 acres within the WSA. Wilderness values would be degraded by varying degrees on 8,500 acres within the 61,960 acres not recommended for wilderness.

Impacts on Energy and Mineral Development

This alternative would close 51,160 acres to all appropriations under the mining and mineral leasing laws, assuming the acquisition of 3,680 acres of the mineral estate of split-estate lands. The remaining 61,960 acres would be open for energy and mineral entry.

Energy Development

Exploration and development would be prohibited on 26,800 acres with moderate potential for geothermal resources by wilderness designation. A total of 49,840 acres with moderate potential and 250 acres with high potential for geothermal resources would be open to energy exploration and development. Twenty geothermal test wells would be drilled as part of exploration in the nonsuitable portion and directly impact 200 acres with indirect impacts throughout the exploration area. A 20-MW powerplant and up to 12 production wells would be developed in the southern part of the WSA directly affecting 160 acres, with indirect impacts affecting 2,000 acres.

Conclusion: There would be no impact to development as projected in the suitable portion. In the nonsuitable portion, 20 exploration wells would be drilled and one 20-MW powerplant would be developed with up to 12 production wells to supply the plant.

Mineral Development

Within the portion recommended suitable for wilderness, projected development of one mine would be precluded on 1,390 acres with high potential for limestone. Development is not projected on 50 acres of the nonsuitable lands with high potential for limestone.

Conclusion: Production would be foregone from one limestone mine.

Impacts on Vegetation

Within the 51,160 acres recommended suitable for wilderness, vegetation would be be expected to remain as described in the vegetation section of the affected environment. Vegetation would be protected or enhanced by the closure of 18 miles of ways and by the prohibition of mineral exploration and development in the area.

On the 61,960 acres recommended nonsuitable, vegetation would be altered or removed on 160 acres by the construction of one 20-MW powerplant and 6 to 12 production wells within 250 acres at the south end of the area. Off-road vehicle travel would have a limited cumulative impact in the vegetated portion of the area east of the Summer Lake playa as access trails to the playa are used or increase in number. Use has been limited to date.

Conclusion: Existing vegetation would be protected on 51,160 acres and 18 acres would revegetate with closure of ways. Relatively minor disturbance would occur due to ORV use in the area found nonsuitable, while geothermal activity would alter or remove vegetation on 160 acres.

Impacts on Wildlife

Wildlife habitat for the approximately 50 mule deer, 24 antelope, and nongame species would be maintained under the partial wilderness alternative. Adequate wildlife forage would be ensured in the preparation of livestock grazing allotment management plan goals. Bighorn sheep would be reintroduced to the area designated wilderness and one guzzler would be constructed. Raptor habitat on the Diablo escarpment would be preserved.

Wildlife habitat on the 61,960 acres recommended nonsuitable would be subject to physical disturbance by continued recreational vehicle use and geothermal exploration activities. Geothermal development in the south portion of the nonsuitable area would eliminate 160 acres of habitat for deer, antelope and other wildlife species. Snowy plover habitat would not be included in wilderness protective management, however wildlife management actions would close nesting areas to vehicles if required.

Conclusion: Wildlife habitat would be preserved on 51,160 acres. One guzzler would be constructed. Vehicle use within the 61,190 acres recommended nonsuitable would adversely effect wildlife habitat.

Impacts on Livestock Grazing

Livestock grazing use would remain at current levels of 588 AUMs. Vehicle use would be prohibited on approximately 18 miles of ways for general management. Most grazing management activities are currently done by horseback within the area at present. Maintenance of seven waterholes would continue heavy equipment use on 9 miles of ways once every 10 years.

In the nonsuitable portion, livestock activity would be unaffected. Vehicle use would continue on 17 miles of vehicle ways.

Conclusion: There would be a minor impact to livestock management activities.

Impacts on Recreation Use

The 18 miles of ways closed to vehicle-oriented recreation would reduce visitor use tied to vehicles; however, due to increases in primitive use, recreation use would be expected to remain stable at less than 100 visitor days per year.

The nonsuitable portion would remain open to vehicle use.

Conclusion: No change in recreation use levels of less than 100 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 588 AUMs and recreation use is expected to remain at less than 100 visitor days per year. One 20-MW geothermal power plant with up to 12 production wells would be developed.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be an unknown increase above the current $8,000 per year attributable to energy development.

Conclusion: Annual local personal income generated from resource outputs would increase by an unknown amount.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 113,120 acres

Impacts on Wilderness Values

Under the no wilderness alternative, the entire 113,120 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and special features such as fossil deposits, snowy plover habitat, and bighorn sheep habitat would be subject to the effects of continued vehicle access and development activities. Projected actions include energy and mineral exploration, development of a 20-MW powerplant in the south end of the area and continued vehicle use with cumulative impacts to wilderness values over time. One wildlife guzzler would be installed impacting .01 acre. A 5,000-acre seeding would be implemented in the southeast portion of the WSA to enhance livestock forage.

Naturalness

The naturalness of the Diablo Mountain WSA would be subject to minor degradation from cumulative effects of vehicle use on 32 miles of ways and cross-country use in the playa and dune areas between the access ways and playa. Exploration and development of energy and mineral resources would directly alter natural conditions on approximately 260 acres and indirectly impact 3,000 acres by development and 6,000 acres by exploration-related activities such as trails, vehicle use and exploration wells. Projects for the benefit of livestock would alter natural conditions on 5,000 acres. Total direct impacts to natural condition would affect approximately 5,460 acres, and indirectly effect approximately 10,000 acres from developments.

Solitude

Continued vehicle use on 32 miles of ways and human activity associated with mineral exploration and development would cause repeated short term local impairment of solitude opportunities adjacent to the activity on approximately 68,000 acres. Operation of a 20-MW power plant and up to 12 production wells would have permanent impacts on approximately 2,000 acres near the development. The development of a limestone mine would impact solitude on approximately 1,000 acres.

Vehicle use would occur primarily on the west side of the area while the rugged, steep country in the eastern portion would still retain significant opportunities for solitude. Waterhole maintenance would degrade solitude on a short-term basis every 10 years. Water hauling in the Five Mile Butte allotment would continue twice daily for the 60 days of licensed use each year. Range seeding would have a temporary impact during implementation.

Primitive and Unconfined Recreation

Energy and mineral development in the WSA would diminish opportunities for primitive recreation activities on approximately 3,000 acres. Exploration activity would reduce primitive recreation potential in the short term on 6,000 acres subject to exploration. Continued vehicle use in the area would adversely affect primitive recreation on about 1,000 acres due to the presence of vehicles and the cumulative impacts on natural conditions resulting from such use.

Special Features

Archeological and paleontological resources could be damaged or removed by continued vehicle use linked with recreation activities. Bighorn sheep habitat would be subject to potential encroachment by humans due to ease of access to the upper reaches of Diablo Mountain.

Snowy plover nesting habitat would not receive the benefits of permanent vehicle closure under wilderness protection. Vehicle designation as a wildlife management planning action could restrict access.

Conclusion: In the absence of wilderness designation, wilderness values would be directly or indirectly impaired to a minor degree on approximately 15,460 acres of the WSA. Wilderness values would be directly degraded on 5,460 acres. Short-term impacts on solitude would occur on approximately 68,000 acres. Archeological and paleontological resources would be subject to disturbance or removal.

Impacts on Energy and Mineral Development

The entire WSA would be open to mineral and energy entry.

Energy Development

Exploration for geothermal and oil and gas resources would occur within the 75,000 acres with moderate potential for occurrence. Exploration would include drilling 20 test wells which would directly impact approximately 200 acres. Exploration activity would be short term and temporary, but potentially would lead to development activities. One 20-MW power plant and up to 12 production wells would be developed within the WSA on 250 acres with high potential for geothermal energy.

Conclusion: Exploration would occur on 75,000 acres. One powerplant would be developed with up to 12 production wells.

Mineral Development

Casual exploration for limestone and diatomite would occur on approximately 68,000 acres. One limestone mine would be developed on the 1,440 acres with high potential for occurrence, disturbing 100 acres and requiring 1 mile of access road. Casual exploration would occur on 25,240 acres with moderate potential for sodium, potassium, lithium or boron along the lake playa on the west side of the WSA.

Conclusion: Exploration for minerals would occur on approximately 69,560 acres. One limestone mine would be developed on 100 acres.

Impacts on Vegetation

Vegetation near the salt flat and in the sand dune areas in the southwest portion of the WSA could be removed by trail development and mechanical effects of continued off-road vehicle use. Mining of limestone would remove vegetation on 100 acres. The construction of a 20-MW power plant and up to 12 production wells would remove or alter vegetation on 160 acres within the 250 acres with high geothermal potential at the south end of the WSA. Exploration activities for energy and mineral resources would alter vegetation on 200 acres associated with vehicle use and drill pads. This impact would be relatively minor in the area as a whole.

The 5,000 acres seeded in the southeast corner of the area would be converted from native plants to introduced grass species to improve livestock forage.

Conclusion: A no wilderness/no action alternative would lead to altered vegetation type on 5,460 acres. Additional disturbance would occur on a limited and often short-term basis.

Impacts on Wildlife

Wildlife habitat for mule deer and antelope would suffer adverse impacts on approximately 460 acres from direct (habitat loss) and indirect (noise, vehicle operations) disturbance on another 1,000 acres due to the limestone mine, geothermal power plant and accompanying wells, and vehicle use. The potential for successful reintroduction of bighorn sheep would be diminished slightly by continued vehicle access for recreation cross country and on 32 miles of ways within the study area, while a guzzler would be constructed to provide water. Snowy plover habitat would be subject to vehicle disturbance, but wildlife management actions would ensure habitat preservation. A 5,000-acre seeding would provide early spring forage for deer and antelope, but would replace native species normally available later in the year.

Conclusion: Under this alternative, spring forage for deer and antelope would be improved, while minor amounts of habitat would be lost. Bighorn sheep habitat would be subject to disturbance by vehicles.

Impacts on Livestock Grazing

Under the no wilderness designation, livestock grazing would continue at present levels of 588 AUMs. Vehicle access on 32 miles of ways would not be restricted. Projects to benefit livestock would be allowed, including 5,000 acres of seeding in the southeast corner of the WSA to enhance forage.

Conclusion: One 5,000-acre seeding to enhance forage would be completed, without increase in licensed use.

Impacts on Recreation Use

Motorized recreation use would continue on 32 miles of ways and cross-country on the Summer Lake playa. Recreation use in the foreseeable future would remain static at less than 100 visitor days per year.

Conclusion: No change in recreation use numbers is foreseen.

Impacts on Local Personal Income

Livestock grazing would remain at 588 AUMs. Recreation use would remain at less than 100 visitor days per year. One 20-MW geothermal power plant with up to 12 production wells and one non-metallic mine would be developed.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be an unknown net increase due to energy and mineral development.

Conclusion: Annual local personal income generated from resource outputs would increase by an unknown amount.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action, energy and mineral exploration would be foregone on 85,150 acres. Vehicle use would be excluded, reducing opportunities for those who prefer this type of recreation on the 32 miles of ways that would be closed.

Seeding would alter vegetation on 5,000 acres from native to non-native types. Development of geothermal energy would directly impact 160 acres and indirectly reduce wilderness values on 3,000 acres.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, most existing short-term uses would continue. No change in visitor days use of 100 visitor days per year is anticipated as recreation use would shift from non-primitive to primitive forms. Geothermal development would occur on 250 acres. The long-term productivity of the wilderness values would be preserved on 85,150 acres, directly lost on 5,160 acres and indirectly impaired on 3,000 acres.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource on 85,150 acres recommended suitable. Approximately 160 acres developed for geothermal energy would face irretrievable loss of wilderness values of solitude, naturalness and primitive and unconfined recreation. Approximately 5,000 acres not originally affected by the Sharptop fire rehabilitation would be subject to alteration of vegetation type to improve forage and loss of native vegetative resource as well as wilderness values.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area is capable of being managed to preserve its wilderness characteristics. Manageability would be enhanced if the two small private inholdings and mineral estate of split-estate parcels were acquired. The acquisitions would prevent potential adverse effects from access to, and incompatible surface-disturbing activities on, these parcels.

Rationale for Selection of the Proposed Action

The proposed action was specifically designed to accommodate public input with regard to the protection of snowy plover habitat, the range of plant communities within the WSA, and to consider the high geothermal potential in the south end of the area. The proposed action will preserve the area's highest wilderness values including bighorn sheep habitat, natural vegetation and geologic conditions, outstanding solitude, cultural and paleontological sites, and opportunities for primitive and unconfined recreation. Preservation of these values would outweigh the benefits of maintaining options for expected casual exploration for energy and mineral resources, development of limestone, continued vehicle use on 32 miles of ways, or cross-country use for recreation.

In the nonsuitable portion the benefits derived from geothermal development and livestock forage enhancement outweigh the values of wilderness.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to the Diablo Mountain WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office.

Comment: Archeological data were not included. **Response:** Cultural resources are known to exist in a number of WSAs, but their presence is not always specifically acknowledged due to the potential for disturbance of the sites. Cultural resources do exist in the northern portion of the Diablo Mountain WSA.

Comment: Large areas were eliminated from the WSA in the inventory by identification of roads that do not qualify as roads. **Response:** The final decision on the inventory was announced in November 1980. No protests or appeals were filed respective to the boundaries identified for Diablo Mountain WSA.

Table 1. Summary of Proposed Management Under Each Alternative, Diablo Mountain WSA (OR-1-58)

Proposed Management	All Wilderness	Enhanced Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	113,120	113,120	85,150	51,160	0
Acres Closed to ORVs by Wilderness Designation	113,120	113,120	85,150	51,160	0
Miles of Ways Closed	32	32	32	18	0
Acres of Full Fee Estate Acquired 1/	0	1,810	320	0	0
Acres of Mineral Estate Acquired 2/	0	5,200	4,900	3,680	0
Acres Withdrawn from Mineral Location and Leasing	107,920	107,920	80,250	47,480	0
Number of geothermal powerplants developed	0	0	1	1	1
Number of non-metallic mines developed	0	0	0	0	1

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[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[2] Upon acquisition of mineral estate, these lands would be withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Diablo Mountain WSA (OR-1-58)

Resource or Activity	All Wilderness	Enhanced Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
Wilderness Values	Wilderness values protected or enhanced on 113,120 acres.	Wilderness values protected or enhanced on 114,930 acres.	Wilderness values protected or enhanced on 85,470 acres, lost on 250 acres, impaired on 7,000 acres.	Wilderness values protected on 51,160 acres, degraded on 8,500 acres, lost on 250 acres.	Wilderness values lost on 5,460 acres Short-term loss of solitude on 68,000 acres.
Energy and Mineral Development	Geothermal plant and limestone mine foregone, exploration foregone.	Geothermal plant and limestone mine foregone. Exploration foregone.	Geothermal plant developed, limestone mine foregone. Exploration foregone on 85,470 acres.	Geothermal plant developed, limestone mine foregone. Exploration foregone on 51,160 acres.	Geothermal plant and limestone mine developed. No impact on exploration.
Vegetation	32 acres revegetated.	32 acres revegetated.	32 acres revegetated, 5,160 acres altered.	18 acres revegetated, 160 acres altered.	5,460 acres vegetation altered.
Wildlife	Habitat preserved, one guzzler built.	Habitat preserved one guzzler built.	Habitat altered on 5,160 acres. Most habitat preserved for plover, sheep, deer, and raptors.	Habitat preserved for plover, sheep, deer and raptors.	Existing habitat preserved, one guzzler constructed.
Livestock Grazing	588 AUMs retained, 32 miles of way closed, minor inconvenience.	588 AUMs retained, 32 miles of way closed, minor inconvenience.	588 AUMs retained, 32 miles of way closed, minor inconvenience.	588 AUMs retained, 18 miles of way closed, minor inconvenience.	No impact
Recreation	No change in use level, change to primitive types of use.	No change in use level, change to primitive types of use	No change in use level, change to primitive types of use.	No change in use level, change to primitive types of use.	No impact
Local Personal Income	Local personal income would remain at approximately $8,000 per year.	Local personal income would remain at approximately $8,000 per year.	Local personal income would increase by an unknown amount due to energy development.	Local personal income would increase by an unknown amount due to energy development.	Local personal income would increase by an unknown amount due to energy and mineral development.

Table 3. Classification of Energy and Mineral Potential, Diablo Mountain WSA (OR-1-58)

Commodity	Area	Level of Potential	Level of Certainty
Evaporites(sodium, potassium,lithium, borates)	See Map 6	M	B
	Rest of WSA	0	B
Metals(gold,mercury)	Entire WSA	L	B
Geothermal	See Map 6	H	D
	See Map 6	M	C
	Rest of WSA	L	A
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	See Map 6	M	B
	Rest of WSA	L	A
Limestone	See Map 6	H	D
	See Map 6	M	B
	Rest of WSA	0	C
Bentonite	Entire WSA	L	C
Diatomite	See Map 6	M	B
	Rest of WSA	0	B
Zeolites	Entire WSA	1	C

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

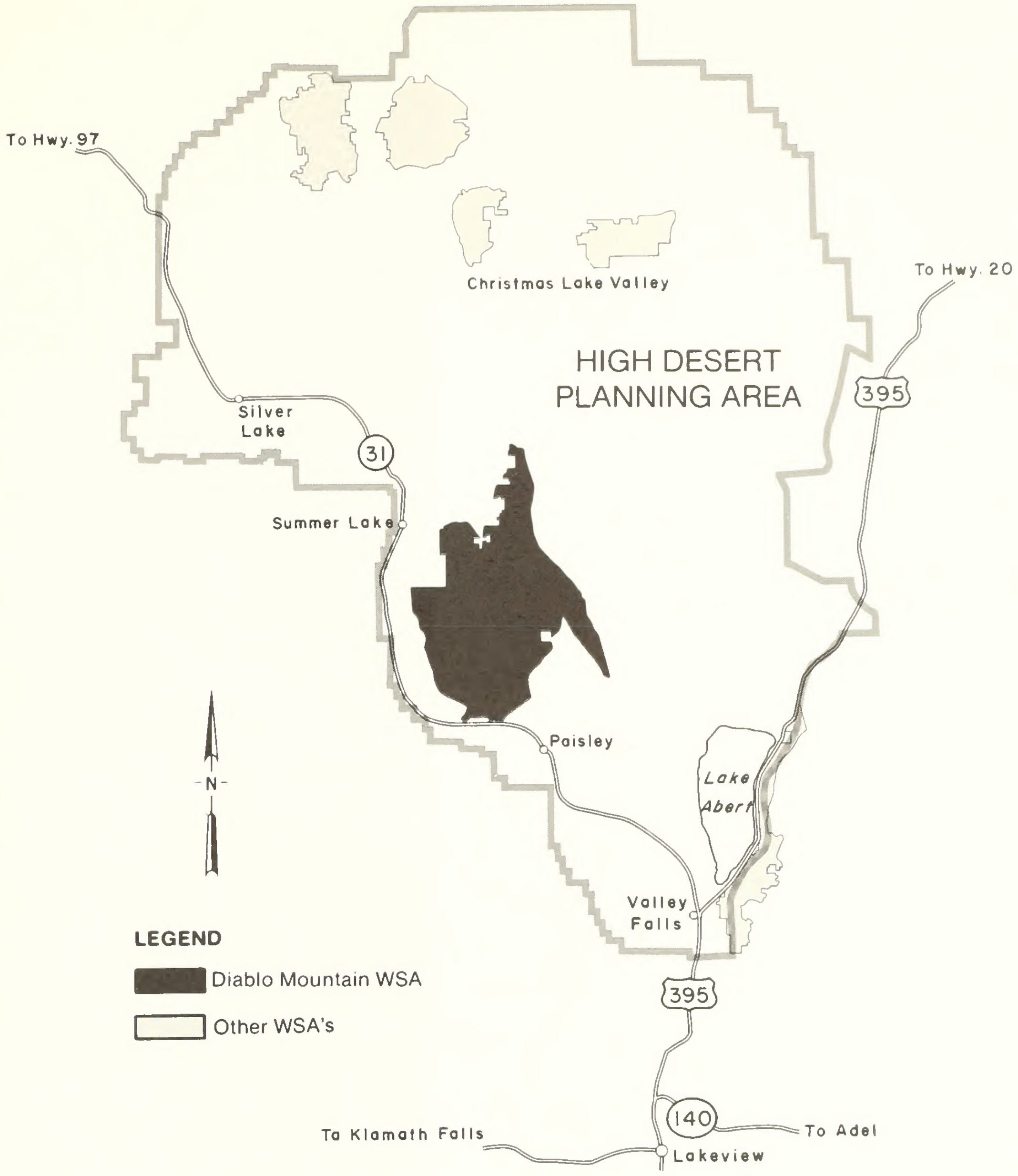
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

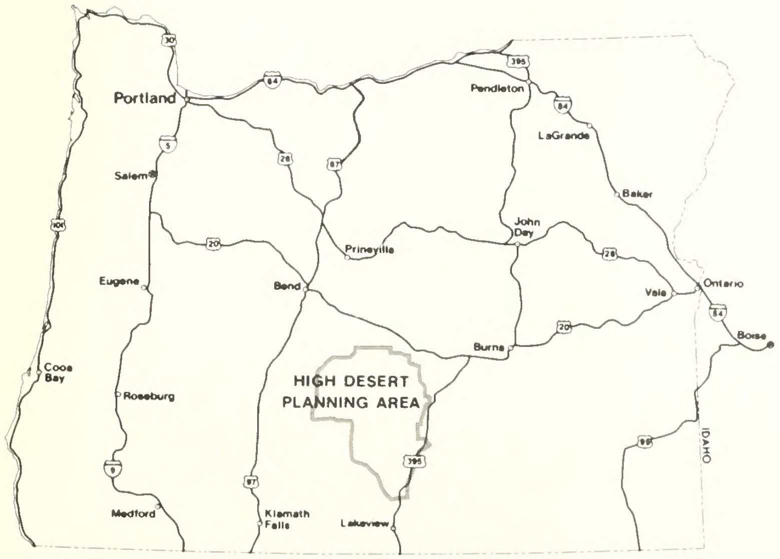
Table 4. Existing Livestock Use, Diablo Mountain WSA (OR-1-58)

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Squaw Lake (No. 418)	834	3/1 - 3/30	.5	17
St. Patricks (No 419)	1,680	3/1 - 7/30	4	67
Paisley Flat (No.422)	467	3/1-7/30	45	15
Rosebud (No. 421)	158	11/1 - 12/30	45	71
Five Mile Butte (No. 426)	674	3/1 - 6/15 and 11/1 - 1/30	52	378
Sheep Rock (No. 428)	4,000	3/1 - 6/15	6	40
Total	7,813			588

Table 5. Effects of Alternatives on Local Personal Income, Diablo Mountain WSA (OR-1-58) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS						
Livestock Grazing	AUMs	no change	no change	no change	no change	no change
Energy & Mineral Development:						
20MW geothermal powerplants	Number	0	0	1	1	1
Non-metallic mines	Number	0	0	0	0	1
Recreation Use	RVD	no change	no change	no change	no change	no change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES						
Livestock Grazing	$	0	0	0	0	0
Energy & Mineral Development:						
20 MW geothermal powerplants	$	0	0	unknown	unknown	unknown
Non-metallic mines	$	0	0	0	0	unknown
Recreation Use	$	0	0	0	0	0





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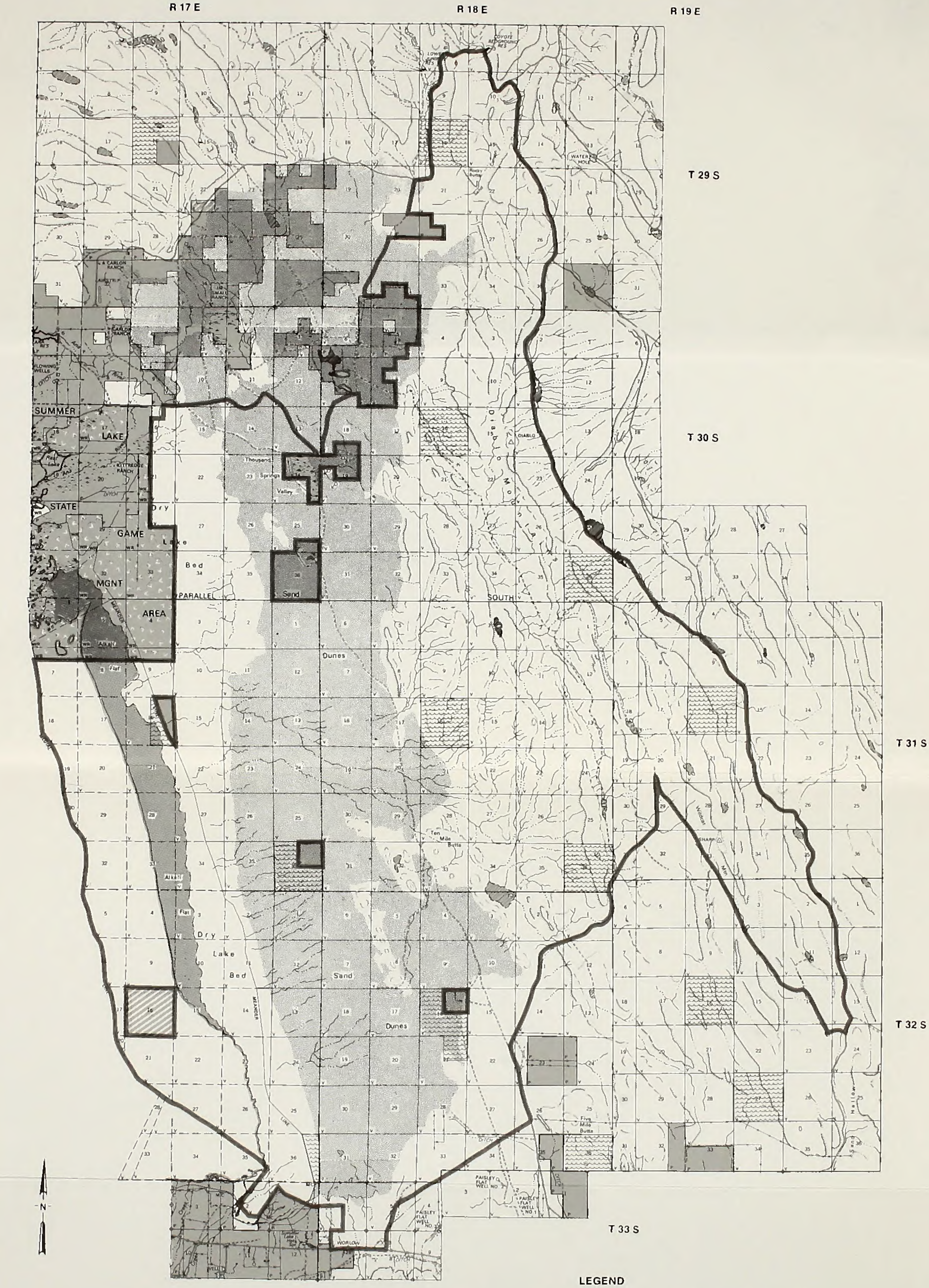
Diablo Mountain WSA
OR-1-58

LOCATION MAP

10 0 10 MILES

MAP 1



U. S. Department of the Interior
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Lakeview District

Diablo Mountain WSA
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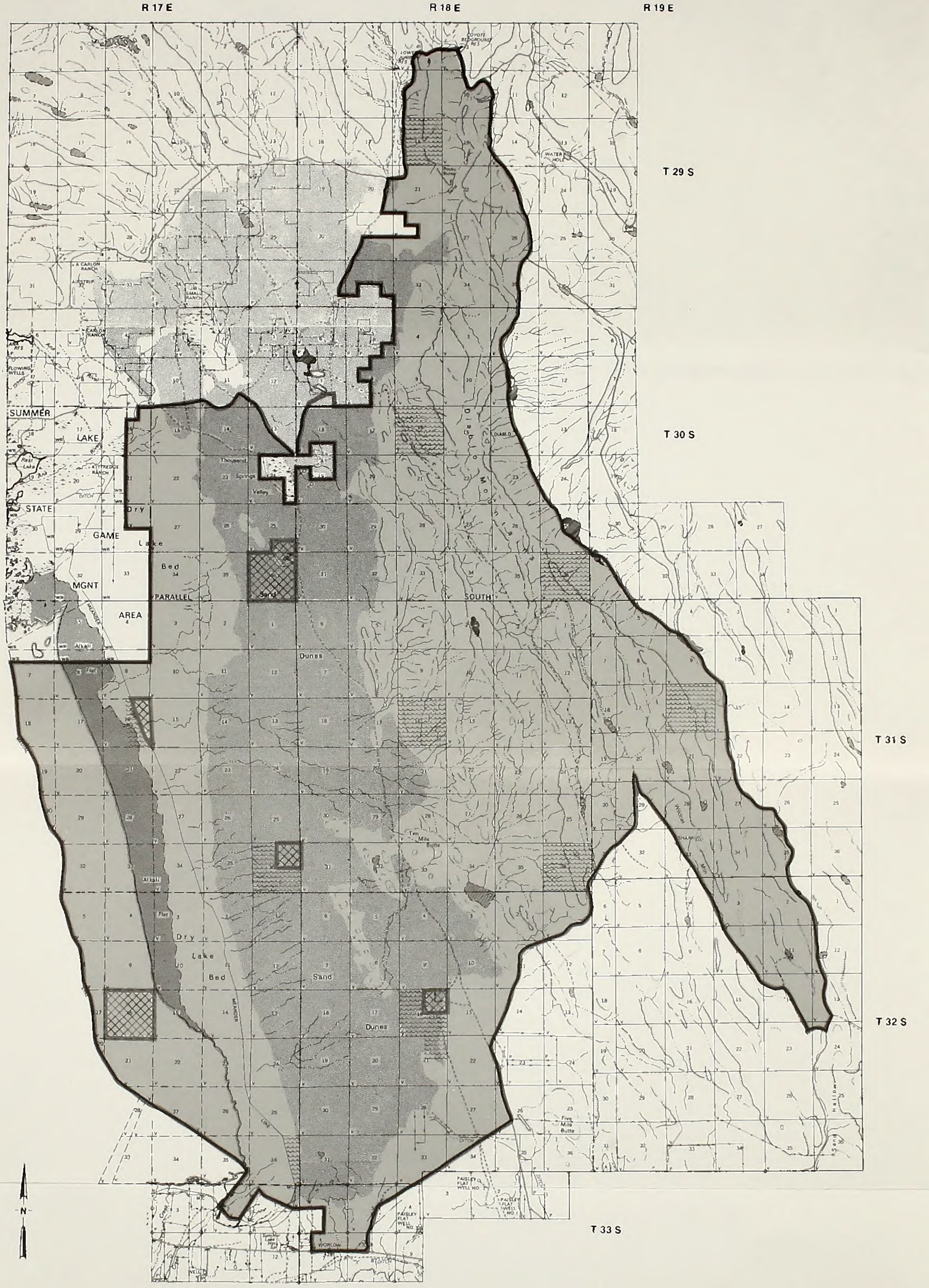
LAND OWNERSHIP

1 0 1 2 MILES

LEGEND

▭	BLM Land in WSA Studied Under Section 603 of FLPMA
—	Wilderness Study Area Boundary
□	Bureau of Land Management
▨	State
■	Private
▦	State Wildlife Refuge
▤	BLM Surface-State or Private Subsurface (Split Estate)

MAP 2



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Diablo Mountain WSA
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ENHANCED ALTERNATIVE

1 0 1 2 MILES

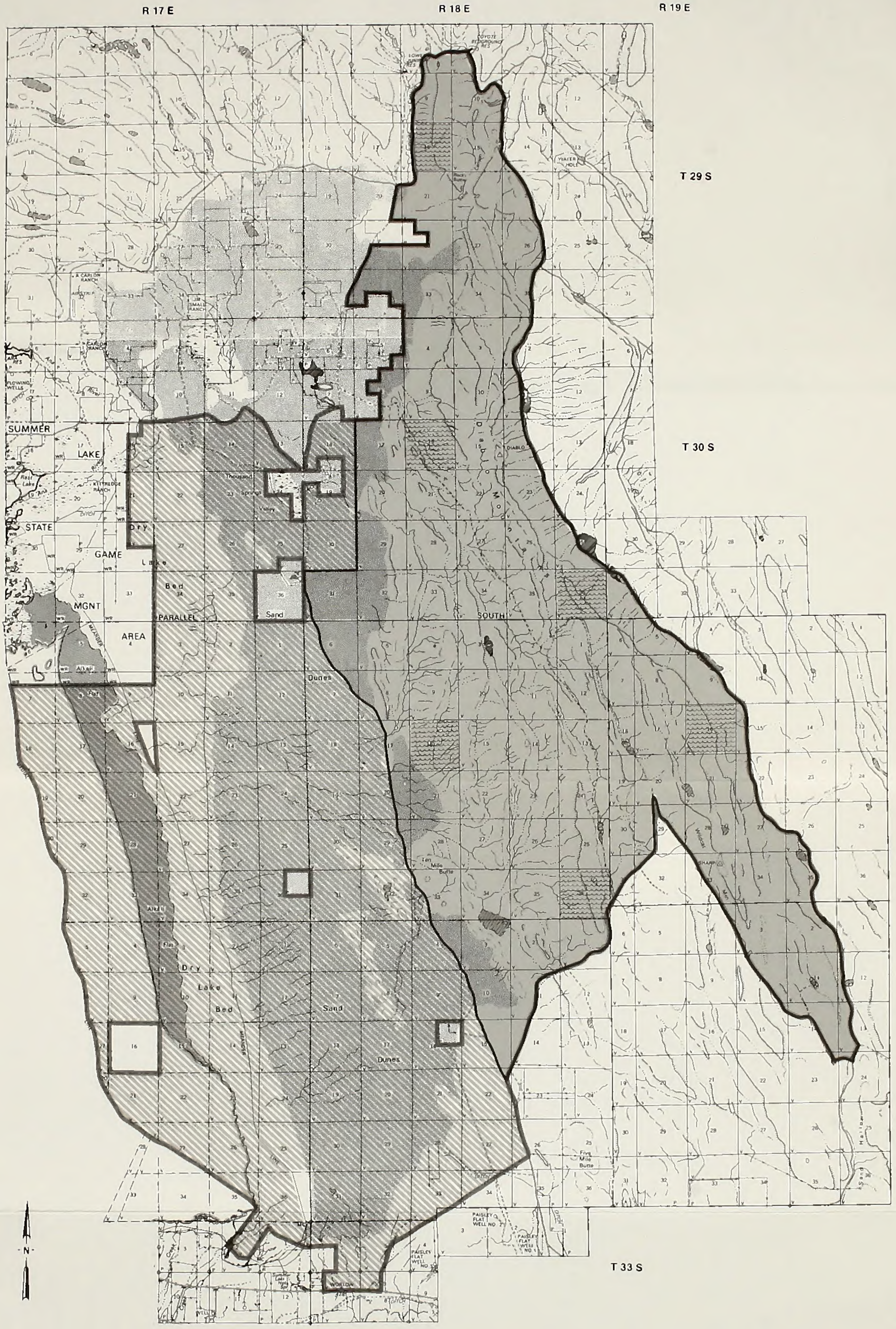
MAP 3

— Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness



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Diablo Mountain WSA
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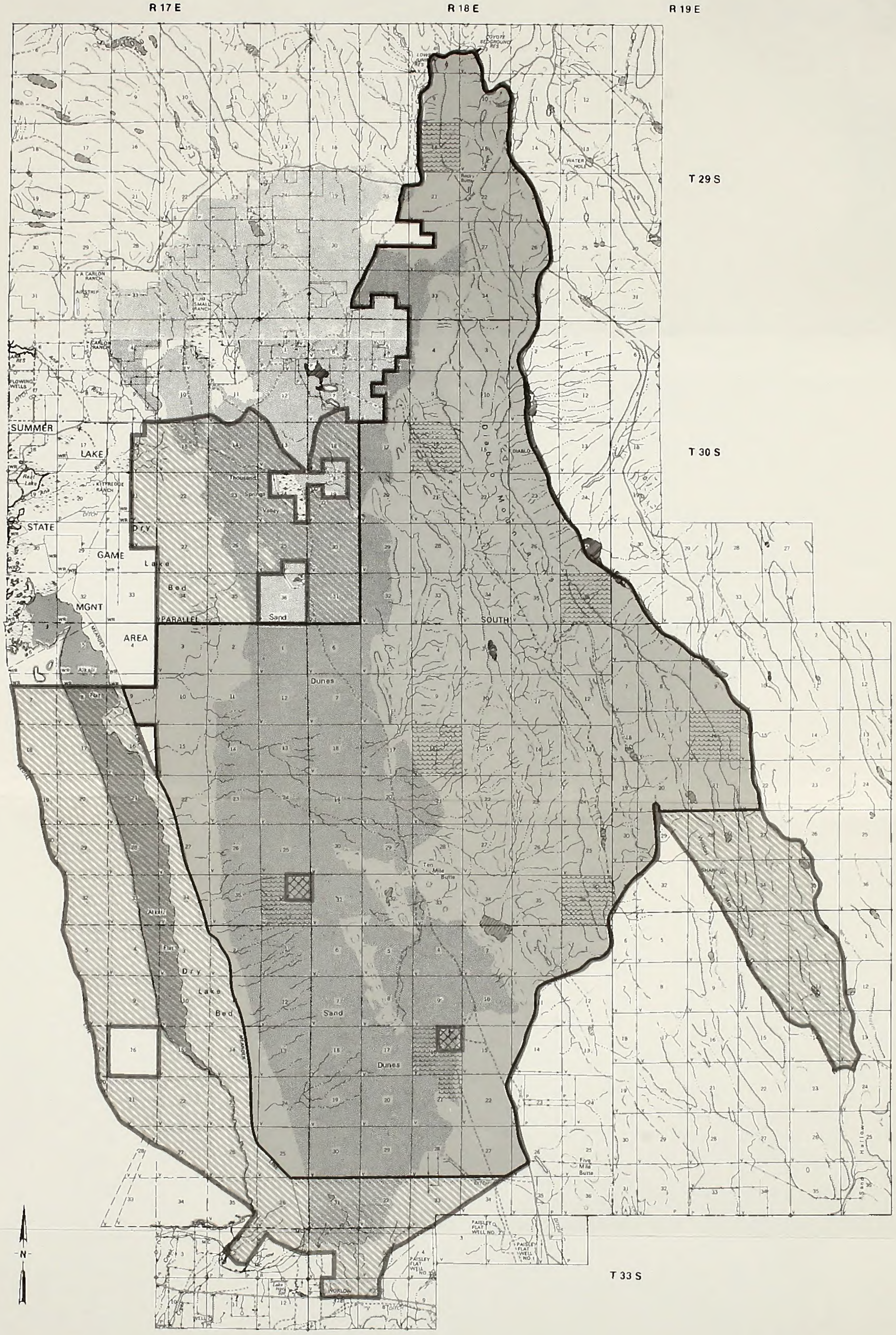
PARTIAL ALTERNATIVE

1 0 1 2 MILES

- ▬ Wilderness Study Area Boundary
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▦ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

MAP 4



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PROPOSED ACTION

MAP 5

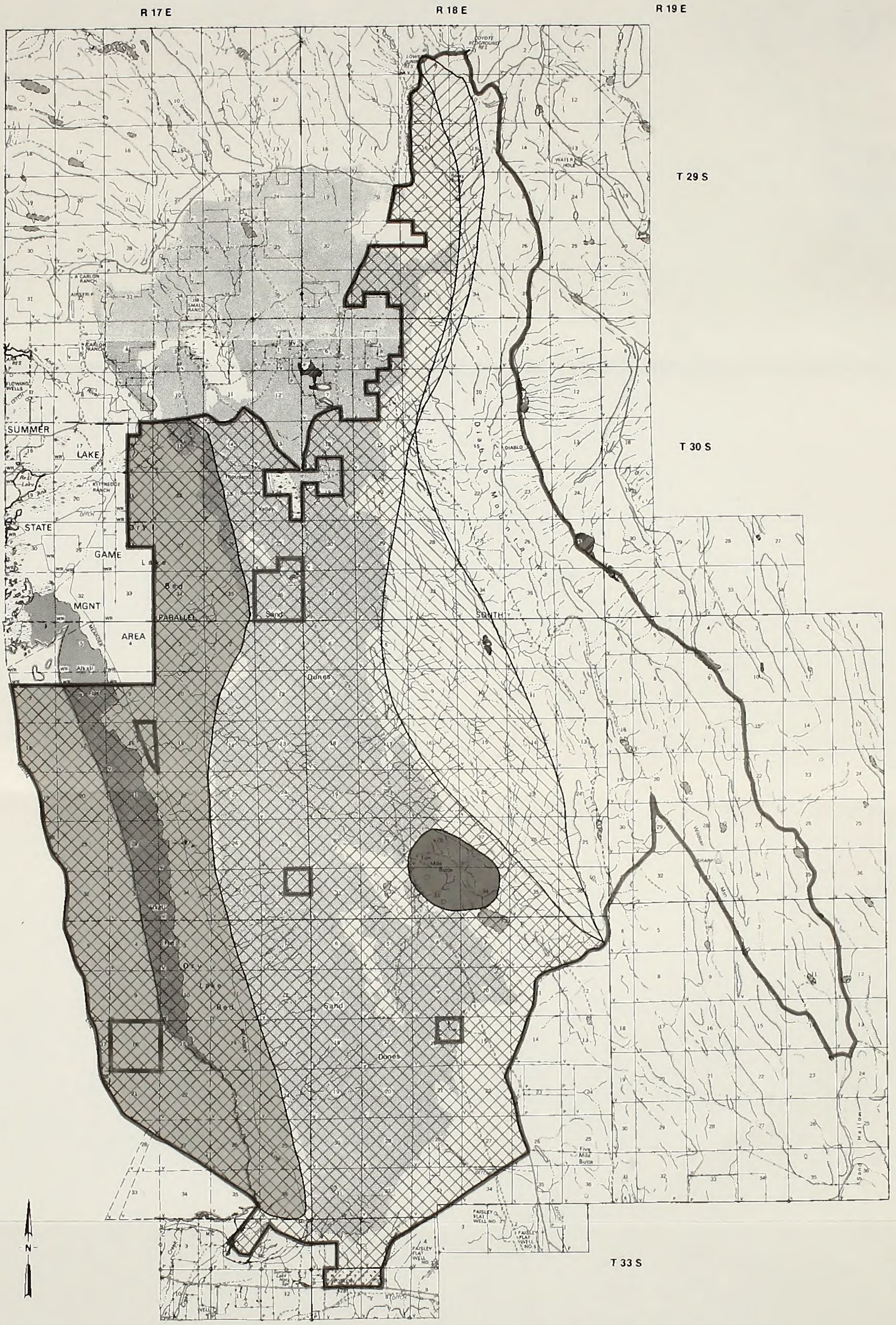
▬ Wilderness Study Area Boundary

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

▩ Non-Federal Land within Recommended Wilderness



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MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 6

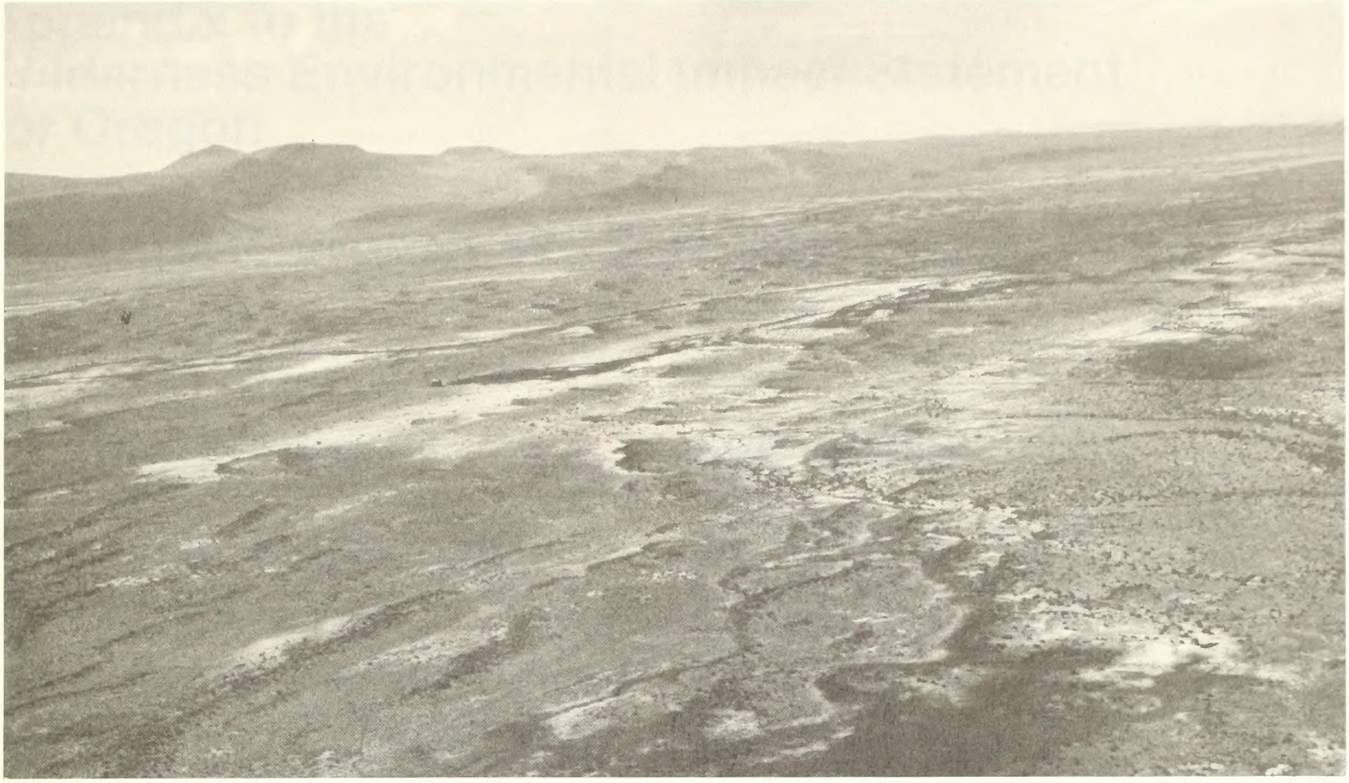
■ **High Potential (HD) for Limestone**

▨ **Moderate Potential (MB) for Limestone and (MC) for Diatomite**

▩ **Moderate Potential (MB) for Sodium, Potassium Lithium and Boron**

▧ **Moderate Potential (MC) for Geothermal and (MB) for Oil and Gas**

▦ **High Potential (HD) for Geothermal Resources (Also, Portion of WSA within known Geothermal Resource Area)**



Diablo Mountain WSA, OR-1-58. Aerial photo from the north boundary looking southeast. Most of the foreground is nonsuitable under the partial and proposed action alternatives and suitable under the enhanced alternative. The middleground and background are suitable under the enhanced, partial and proposed action alternatives. Illustrates both the valley bottom and ridges in the northern portion of the WSA. April 1980.

Diablo Mountain WSA, OR-1-58. Aerial photo in east-central portion of the WSA looking north to Diablo Mountain. Within area recommended suitable under the enhanced, partial and proposed action alternatives. Topography characteristics of the east half of the WSA. April 1980.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Orejana Canyon Wilderness Study Area (OR-1-78)

1. Introduction

General Description of Study Area

Orejana Canyon Wilderness Study Area is located in Harney County 30 miles northeast of the small town of Plush, Oregon (see Map 1). The nearest highway is U.S. Highway 395, 35 miles to the west of the WSA. Oregon State Highway 140 is approximately 40 miles to the south. Access from either highway is by dirt roads.

Roughly oblong in shape, the study area contains 24,600 acres, all of it public land (see Map 2). The surrounding lands are primarily BLM lands except for a block of State land to the west in the north end of Warner Valley. The southern, eastern and northern boundaries are defined by low standard roads; the western boundary is defined by a low standard road for approximately 5 miles and by a way for approximately 7 miles along the base of Orejana Rim. A 0.5-mile dead-end road extends to Shingle Reservoir from the east side of the WSA, forming part of the boundary.

Topographic features include the 500-foot-high Orejana Rim and the 8.5-mile-long Orejana Canyon which runs most of the length of the WSA from north to south. Orejana Canyon has five small side canyons along its length. There is a flat tableland between the rim and the canyon known as The Island. A broad swale known as The Basin constitutes the northern portion of the WSA.

Vegetation in the study area is sagebrush/bunchgrass.

Interrelationships

Orejana Canyon WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) 2,507-square-mile Beatys Butte Wildlife Management Unit and supports migrant populations of 40 to 100 mule deer and 20 to 30 pronghorn antelope. ODFW unit management goals for mule deer are to maintain a summer adult population of 1,500 animals and a ratio of 12 bucks to 100 does. ODFW has not set management objectives for antelope. Orejana Canyon WSA is also winter and early spring range for approximately 100 male California Bighorn Sheep, a candidate threatened and endangered species. ODFW has not set management objectives for California Bighorn Sheep for this area, but the present Hart Mountain population of 468 animals is considered to be above carrying capacity. Transplanting sheep to other areas is the current method of population reduction. The goal for nongame wildlife is to maintain populations of naturally-occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

The Orejana Canyon WSA is approximately 4 miles north of the Hart Mountain National Antelope Refuge, administered by the U.S. Fish and Wildlife Service.

Harney County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources selected as issues specifically for the Orejana Canyon WSA include:

- impact on the area's wilderness values,
- impact on livestock grazing use levels and management, particularly in The Basin area,
- impact on potential energy and mineral development,
- impact on bighorn sheep and sage grouse,
- impact on paleontologic and geologic resources, and
- impact on economic value of existing and projected resource outputs and local personal income derived from them.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness
- partial (proposed action)
- no wilderness/no action

An enhanced wilderness alternative is not analyzed because there is no feasible opportunity to significantly enhance wilderness values by acquiring private inholdings, closing interior roads or acquiring adjacent private land. One recommendation to expand the WSA south to the Poker Jim Ridge WSA on the Hart Mountain Refuge is not analyzed as the WSA's southern boundary road is a primary access route to public lands east of the WSA, and it would not be practical to close this road.

All Wilderness

The all wilderness alternative would recommend all 24,600 acres of the WSA suitable as wilderness (see Map 2). For purposes of analysis, this alternative assumes the 0.5-mile dead-end road to Shingle Reservoir would remain open.

Energy and Mineral Development Actions

The all wilderness alternative would withdraw 24,600 acres from all appropriations under mining and mineral leasing laws. A low potential for occurrence of gold, silver, lead and antimony is identified for 2,800 acres along Orejana Rim based on indirect evidence (geochemical anomalies). A low potential for tin has also been identified in the northern portion of the study area.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to sustain present wildlife populations in accordance with ODFW management goals and in a manner consistent with BLM's Wilderness Management Policy. Forage availability for wildlife is coordinated in conjunction with the livestock allotment management plan.

Three wildlife guzzlers are proposed to facilitate the expansion of California Bighorn Sheep, an extirpated species, into their historic range. Human activities have altered natural habitat and interrupted patterns of movement, so placement of the guzzlers would be allowed under wilderness management to restore previously occurring types of use by a native species. The guzzlers would be placed when, and if, they are needed to encourage sheep to remain on northern portions of their range.

Livestock Management Actions

Under this alternative, grazing use would remain at the current level of 777 AUMs. The study area contains portions of three grazing allotments. Table 4 identifies these allotments and their seasons of use. Vehicle use for routine livestock management on 13 miles of ways would be precluded.

Checking and salting livestock, and maintenance of 3 miles of fence would be accomplished by horseback. Salting would occur primarily in The Basin portion of the study area. It is difficult to haul horses to this remote location over poor roads for routine checking of livestock. Maintenance of 11 waterholes would bee accomplished with heavy equipment once every 6 to 10 years. The 0.5-mile road to Shingle Reservoir would remain open to vehicle use for livestock management.

Recreation Management Actions

The all wilderness alternative would close 24,600 acres, including 13 miles of ways, to vehicle-dependent recreation. The 0.5-mile dead-end road to Shingle Reservoir would remain open. Recreation use is currently estimated at less than 100 visitor days per year in the WSA.

Partial (Proposed Action)

The partial alternative would recommend 14,800 acres suitable as wilderness (see Map 3). Some 9,800 acres, including the area in The Basin and west of the rim on the north would be recommended nonsuitable. The northern boundary would follow a fence which runs northeast to southwest across the sixth standard parallel. At the rim, the boundary would follow a section line west to intersect the boundary way below the rim. The 0.5-mile dead-end road to Shingle Reservoir would remain open. The Orejana Rim and Canyon are in the area recommended suitable for wilderness.

Energy and Mineral Development Actions

Wilderness designation would withdraw 14,800 acres from mineral entry. Lack of evidence for energy resources indicates that no exploration other than casual is likely. The 2,800 acres which have a low potential based on indirect evidence for gold, silver, lead and antimony lie within the suitable portion. Geochemical and geophysical exploration for gold and silver, without surface disturbance, is projected.

The 9,800 acres recommended nonsuitable would be open to mineral and energy entry. Although the potential for tin is low, geochemical and geophysical exploration for this resource is expected, resulting in possible drilling. While development is possible if tin is located, it is not projected due to low potential for occurrence of an economic deposit.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to sustain present wildlife populations in accordance with ODFW management goals on both the suitable and nonsuitable acreages. Habitat for 40 to 100 mule deer, 20 to 30 antelope and 100 bighorn sheep would be maintained. Forage availability for wildlife is coordinated in conjunction with the livestock allotment management plan.

Three wildlife guzzlers are proposed in the suitable portion to facilitate the expansion of California Bighorn Sheep, an extirpated species, into their historic range. Human activities have altered natural habitat and interrupted patterns of movement, so placement of the guzzlers would be allowed under wilderness management to restore previously occurring types of use by a native species. The guzzlers would be placed when, and if, they are needed to encourage sheep to remain on northern portions of their range.

Livestock Management Actions

Under the partial alternative, grazing use would be kept at the current level of 777 AUMs. Vehicle use for routine livestock management would be precluded on 2 miles of ways. The 0.5-mile of road to Shingle Reservoir would remain open. Heavy equipment would be used every 6 to 10 years for reservoir maintenance.

On the 9,800 acres recommended nonsuitable, vehicle use for livestock management and facility maintenance would continue on 11 miles of ways 3 or more times per year.

Recreation Management Actions

Under this alternative 14,800 acres, including 2 miles of ways, would be closed to vehicle-oriented recreation. The 9,800 acres recommended nonsuitable, which includes 11 miles of ways, would remain open to vehicle-oriented recreation. Current recreational use is estimated to be less than 100 visitor days per year in the WSA.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 24,600 acres would be open to mineral entry. There are no energy resources with moderate or high potential for occurrence in the WSA, therefore no exploration, other than casual, is expected for these resources. Casual exploration (geochemical and geophysical surveys) for gold and silver along the western edge of the WSA and for tin in the northern portion of the WSA is expected, with possible drilling as a result. While development is possible if deposits are located, it is not projected due to the low potential for occurrence of an economic deposit.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to sustain present wildlife populations in accordance with ODFW management goals and BLM's Wilderness Management Policy. Habitat for 40 to 100 mule deer, 20 to 30 antelope and 100 bighorn sheep would be maintained. Forage availability for wildlife is coordinated in conjunction with the livestock allotment management plan.

Three wildlife guzzlers are proposed to facilitate the expansion of California Bighorn Sheep, an extirpated, species, into their historic range. Human activities have altered natural habitat and interrupted patterns of movement, so placement of the guzzlers would be allowed under wilderness management to restore previously occurring types of use by a native species. The guzzlers would be placed when, and if, they are needed to encourage sheep to remain on northern portions of their range.

Livestock Management Actions

Under this alternative, grazing use would remain at the current level of 777 AUMs. A proposed burn-for-release project on 960 acres would increase forage in the east portion of the WSA and would allow for a shift of 226 AUMs of livestock use into this portion of the allotment. Vehicle use for livestock management, maintenance of 3 miles of fence, and maintenance of 11 reservoirs and waterholes would continue on 13 miles of ways and 0.5-mile of road.

Recreation Management Actions

All 24,600 acres and 13 miles of ways and 0.5-mile of road within the study area would remain open. Current recreation use in the WSA amounts to less than 100 visitor days per year.

Summary

Table 1 summarizes the projected management actions in the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears to be generally natural. The area within Orejana Canyon and on The Island is predominantly natural in appearance. Shingle Reservoir, within the confines of the canyon, is well masked by vegetation and difficult to locate visually. The 0.5-mile dead-end road to Shingle Reservoir within the canyon has only a localized impact.

There are a total of 11 reservoirs and waterholes in the WSA. The berms resulting from the construction of Hartman Reservoir are quite noticeable from many areas within The Basin, although they are revegetating to some extent. Two of the reservoirs in the area are barely noticeable. There are approximately 11 miles of vehicle ways in The Basin and less than 2 miles in the rest of the area. A 0.5-mile dead-end road extends from the east boundary to Shingle Reservoir. The ways in The Basin and the waterholes do become evident when residual ground cover is removed during grazing use periods. In rest years the vehicle ways are more difficult to locate due to vegetative growth. Approximately 3 miles of fence cross the WSA south of The Basin to the rim. Unnatural features are visible from approximately 2 percent of the WSA.

Opportunities for Solitude and Primitive and Unconfined Recreation

Outstanding opportunities for solitude are available in Orejana Canyon and on The Island between Orejana Rim and the canyon. Orejana Canyon is fairly wide, with five small side canyons, and the entire 8.5-mile length offers opportunities for isolation even with moderate levels of use. The Island is isolated topographically and is large enough to afford ample opportunities for solitude. The Basin offers less opportunity for solitude, because of the openness and exposure within the terrain type.

Potential for primitive recreation, including hiking, photography and nature study, is best in the canyon and along the rim. Less dramatic features are available elsewhere in the study area. The face of Orejana Rim offers several unique opportunities for sightseeing, including obsidian flows and paleontological features.

Special Features

Orejana Rim is an example of the distinctive basin and range topography of southeastern Oregon, and it contains exceptional geologic and paleontological features (obsidian and fossils). The area provides habitat for California Bighorn Sheep and sage grouse, both Federal candidate species for Threatened and Endangered status. It also has a high potential for supporting nesting raptors.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Orejana Canyon WSA is located in the Intermountain Sagebrush Province with a potential natural vegetation of sagebrush steppe. Big sagebrush/Idaho fescue and low sagebrush/Sandberg's bluegrass are the vegetative communities known to occur in the WSA and that are classified in the Oregon Natural Heritage Plan in the Basin and Range section.

There are three standard metropolitan statistical areas over 100,000 population within 5 hours' driving time of the WSA: Eugene/Springfield and Medford, Oregon; and Boise, Idaho.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and data provided in a report by TERRADATA, a consulting firm under contract with BLM. The report is titled "Assessment of Geology, Energy, and Minerals Resources of the Mule Springs Valley Geologic Resource Area." Additional minerals information has been provided by the U. S. Bureau of Mines in a 1987 report entitled "Mineral Resources of the Orejana Canyon Study Area, Harney County, Oregon."

The WSA is within the Mule Springs Valley geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 gives the mineral potential classifications for the WSA. Map 4 shows where energy and mineral resources have moderate or high potential for occurrence in the WSA.

Surface rocks of the WSA are mostly Tertiary welded and nonwelded tuffaceous sedimentary rocks and basalt flows. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

There are no known geothermal or oil and gas deposits beneath the WSA. No energy resources have been rated as having moderate or high potential for occurrence in the WSA. As of October 16, 1987, there were no leases for energy resources within the WSA.

Mineral Resources

There is a moderate potential for the occurrence of diatomite on 2,200 acres within the WSA. There is a low potential for the occurrence of gold, silver, lead and antimony on 2,800 acres based on indirect evidence (geochemical anomalies). Indirect evidence also indicates a low potential for tin in the northern portion of the study area. There are no known commercial mineral deposits in the WSA or within several miles of the WSA. As of October 16, 1987, there were no mining claims in the WSA.

Vegetation

Vegetation in the northern half of the WSA consists of intermingled communities of low sagebrush/Sandberg's bluegrass and big sagebrush/Sandberg's bluegrass. The southern half of the study area supports communities of big sagebrush/Thurber's needlegrass, big sagebrush/Sandberg's bluegrass and big sagebrush/cheatgrass. Big sagebrush/Idaho fescue is common in Orejana Canyon. The western canyon slope, in particular, supports nearly pristine stands of native bunchgrasses.

The vegetative communities are early to mid-seral. Common wildflowers include milk-vetches, sagebrush violet, Nevada desert-parsley, long-leaved phlox, stemless goldenweed and yellow bells.

There are no known threatened and endangered plant species within the WSA.

Wildlife

Orejana Rim has high potential for raptor nesting sites. The WSA provides year-round habitat for chukar, partridge and quail. Sage grouse, a State Threatened species and a candidate for Federal listing as Threatened or Endangered, also inhabit the study area in undetermined numbers.

The area is used as winter and early spring range by approximately 100 bighorn rams, which move south onto Hart Mountain for most of the year. The winter movement to the lower elevation of Orejana Canyon is due to the availability and accessibility of forage. During the summer they prefer the cooler temperatures of the higher elevation of Hart Mountain. Condition of the sheep is good.

Approximately 40 to 100 mule deer and 20 to 30 antelope frequent the WSA. Observed herd condition of both species is good.

Other wildlife species include red-tailed hawk, golden eagle, raven, turkey vultures, burrowing owl, rock wren, sage sparrow, badger, marmot, black-tailed jack rabbit, coyote, gopher snake, rattlesnake, fence lizard, horned lizard, and various species of rodents and insects.

Watershed

There are no perennial streams or springs in the study area.

Livestock Grazing

Portions of three grazing allotments are within the WSA. Table 4 shows existing livestock use in the study area in AUMs.

Existing livestock projects in the WSA (among features mentioned in the Naturalness section) include 11 reservoirs and waterholes and 3 miles of fence.

Livestock operators use motor vehicles on the ways within the WSA primarily for checking livestock and salting. Livestock are gathered by horseback. Ryegrass Corral at the foot of Orejana Rim is used occasionally to gather injured, sick or stray livestock to be trucked out of the area.

Recreation Use

Current recreation use is mainly associated with deer hunting. This activity is closely tied to vehicle use on ways in this WSA. Recreation use in the area is less than 100 visitor days per year.

Local Personal Income

Livestock use at the current level of 777 AUMs and recreation use totaling fewer than 100 visitor days per year generate $9,324 and approximately $1,200 respectively. The overall total of local personal income is approximately $10,500. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 24,600 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The all wilderness alternative would add 24,600 acres to the National Wilderness Preservation System, and wilderness values within the entire WSA would be protected by legislative mandate. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and such special features as potential raptor nesting area, bighorn sheep and sage grouse habitat, and unique paleontologic and geologic features would be preserved in a natural condition and setting.

Naturalness

The naturalness of the area, characterized by the bunchgrass-covered slopes of Orejana Canyon and by undisturbed paleontologic and geologic features, would be enhanced under this alternative with closure of 13 miles of ways within the WSA, allowing for vegetative recovery of disturbed areas (approximately 13 acres) in 3 to 5 years. Use of heavy equipment for waterhole maintenance every 6 to 10 years would result in a short-term loss of vigor of plants along the access route, but would not prevent these ways from revegetating.

The placement of three wildlife guzzlers to facilitate the expansion of California Bighorn Sheep into its historic range would impact naturalness in the immediate vicinity of the guzzlers, an area estimated to be approximately 0.3 acre for each guzzler.

Solitude

The opportunity for solitude in this remote area would be enhanced under this alternative, especially in The Basin, as vehicle use on 13 miles of ways would be eliminated. This would eliminate the most noticeable human activity affecting visitor perceptions of solitude. Short-term, localized impacts on solitude from periodic vehicle access to Shingle Reservoir would affect approximately 500 acres around 0.5-mile of road.

Primitive and Unconfined Recreation

Restoration of the natural environment and elimination of the sights and sounds associated with vehicles would enhance primitive and unconfined recreation, such as hiking, backpacking and birdwatching. Considering the access available to this relatively small area, primitive hunting opportunities could be improved in the absence of vehicle-borne hunters disturbing and scattering game. Short-term, localized impacts on primitive and unconfined recreation from periodic vehicle access to Shingle Reservoir would affect approximately 500 acres.

Special Features

All wilderness designation would preserve and protect spring range for the California Bighorn Sheep, a candidate species for Federal listing as Threatened and Endangered, by eliminating motorized traffic that could disturb the animals. The geological and paleontological features of the WSA, as well as the potential raptor nesting area and existing sage grouse habitat would also be preserved by legislatively mandated protection.

Conclusion: Wilderness designation of the entire 24,600 acres within the Orejana Canyon WSA would result in protection of existing wilderness values and probable enhancement of those values.

Impacts on Mineral and Energy Development

Wilderness designation would withdraw 24,600 acres from all appropriations under mining and mineral leasing laws.

Energy Development

The entire 24,600 acres would be closed to energy development. Since there are no energy resources with moderate or high potential for occurrence in the WSA, no exploration, other than casual, with no development is projected.

Conclusion: No impact on energy development is expected since none is projected.

Mineral Development

Surface-disturbing exploration for diatomite, which has a moderate potential for occurrence on 2,200 acres would be precluded. No exploration or development of this resource is expected due to poor accessibility, distance to market and the availability of diatomite in several areas throughout southeastern Oregon.

Geophysical and geochemical exploration methods not involving surface disturbance would be expected for gold on 2,800 acres in the western portion, and for tin in the northern portion of the WSA. No exploratory drilling or development of any of these resources would occur.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

The 24,600 acres recommended suitable under this alternative would not be subject to most surface-disturbing activities. Vegetation dependent upon the existing undeveloped environment, as described in the Affected Environment, would be maintained. Ecological status (mainly early to mid-seral) would progress according to natural succession. Utilization of key forage species would remain at less than 50 percent with a corresponding maintenance of residual ground cover.

Closure of 13 miles of ways would allow for their revegetation in 3 to 5 years. Improvement would be evident over the short term due to reduced use.

Conclusion: Little or no change would occur to overall vegetation. Thirteen miles of ways would revegetate in 3 to 5 years.

Impacts on Wildlife

The all wilderness alternative would preserve wildlife habitat within the 24,600 acres recommended suitable, including habitat for the approximately 40 to 100 mule deer and 20 to 30 pronghorn antelope which frequent the area, as well as for sage grouse and nongame wildlife species.

The installation of three wildlife guzzlers would improve deteriorated habitat for the expanding bighorn sheep population by encouraging occupation of historical use areas for longer periods. ODFW currently has no management goals for this herd, nor has the carrying capacity of Orejana Canyon WSA been determined. Elimination of vehicles would reduce human disturbance of bighorn sheep and allow fuller utilization of habitat.

Conclusion: Wildlife habitat and population levels would be maintained while habitat for bighorn sheep would be enhanced.

Impacts on Livestock Grazing

Under this alternative, livestock use in the allotment would remain at the current use level of 777 AUMs. Vehicle use for routine livestock management would be excluded. Livestock management activities, including salting, checking, and maintenance of 3 miles of fence would be accomplished by horseback. This restriction would cause a slight inconvenience to livestock operators. The road to Shingle Reservoir would remain open.

Use of heavy equipment would be permitted every 6 to 10 years for maintenance of 11 waterholes. A shift of 226 AUMs into the WSA from other portions of the allotment would not be realized due to the preclusion of a 960-acre burn-for-release project in the eastern portion of the WSA.

Conclusion: A shift of 226 AUMs of allocated livestock forage into the WSA portion of the allotment would be foregone. Restricted vehicle use on 13 miles of ways would cause a slight inconvenience to livestock operators.

Impacts on Recreation

The 24,600 acres of the study area, including 13 miles of ways, would be closed to vehicle-dependent hunters or recreationists within the WSA. The same action would enhance opportunities for primitive types of recreation, including hunting on foot or by horseback. No measurable change in overall number of visitor days per year (less than 100) is anticipated.

Conclusion: Use numbers would not change measurably, but types of activity would shift from motorized to primitive forms of recreation.

Impacts on Local Personal Income

Livestock grazing would remain at 777 AUMs and recreation use numbers are not expected to change significantly. Local personal income generated from these activities would not change under this alternative, as shown in Table 5.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $10,300.

Partial (Proposed Action)

Recommended suitable for wilderness: 14,800 acres
Recommended nonsuitable for wilderness: 9,800 acres

Impacts on Wilderness Values

The partial alternative would add 14,800 acres to the NWPS. It would preserve opportunities for solitude and primitive recreation, natural values on Orejana Rim and in Orejana Canyon, sage grouse habitat, potential raptor nesting sites and bighorn sheep habitat in this portion of the WSA.

The 9,800 acres in The Basin and west of Orejana Rim would not receive special legislative protection. Wilderness values of naturalness, solitude, and primitive and unconfined recreation would continue to be affected by unrestricted vehicle use on 11 miles of ways and potential development of new ways due to cross-country use in The Basin.

Naturalness

Naturalness would be preserved in the portion recommended suitable: the Canyon, Rim and Island. Two miles of ways would revegetate, enhancing naturalness on 2 acres and indirectly affecting about 60 acres. The placement of three wildlife guzzlers, if deemed necessary to facilitate the expansion of California Bighorn Sheep into their historic range, would directly impact naturalness on less than 1 acre, causing a visual impact on about 30 acres. The collective visual impact would be improvement of naturalness on about 30 acres within the suitable portion.

The Basin in the north and lands along the northwestern portion of the WSA not receiving wilderness protection would be open to vehicle use. Continued use of ways and possible extension of the ways from cross-country use would add to physical disturbance of the area's natural appearance, visually affecting approximately 900 acres. Exploratory drilling for tin could occur in The Basin, affecting as much as 1,300 acres visually. The total area impacted by actions affecting naturalness could increase from about 440 to 2,300 acres.

Solitude

Opportunities for solitude within the 14,800-acre portion recommended suitable would be preserved. Periodic short-term disruption of solitude in the vicinity of Shingle Reservoir would result from continued vehicle access on the dead-end road, and from long-term maintenance of the reservoir. There would also be a short-term impact to solitude during the placement of three guzzlers, should these projects be necessary for the expansion of bighorn sheep into their historical range.

On the 9,800 acres recommended nonsuitable for wilderness, opportunities for solitude would continue to be impaired by vehicle use on 11 miles of ways and cross-country use, affecting approximately 900 acres. Exploratory drilling for tin would have a short-term impact on solitude over about 1,300 acres.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be preserved within the Canyon and Rim areas and on The Island. Closure of 2 miles of ways would enhance these opportunities by eliminating vehicle traffic. There would be periodic, short-term disturbance of the primitive recreation experience in the vicinity of Shingle Reservoir due to continued vehicle access on the dead-end road leading to it, and to the presence of heavy equipment once every 6 to 10 years to maintain it.

In the 9,800-acre portion recommended nonsuitable for wilderness, opportunities for primitive types of recreation would continue to be reduced by livestock management activities using vehicles or mechanical equipment. Primitive opportunities, during hunting seasons especially, would continue to be impacted due to the sights, sounds and physical impacts of vehicle-oriented hunting activities on 11 miles of ways. Additionally, there would be impacts from cross-country use of vehicles to pursue or recover game. Exploratory drilling for tin would have short-term impacts to primitive recreation opportunities by the presence and noise of drilling machinery.

Special Features

The potential raptor nesting area and the geologic and paleontologic features of Orejana Rim and habitat for bighorn sheep and sage grouse habitat in Orejana Canyon and on The Island would be preserved and protected. The placement of three guzzlers would facilitate the expansion of bighorn sheep into their historic range, while impacting less than 1 acre collectively. Eliminating motorized vehicle use on 2 miles of ways would reduce impacts to bighorn sheep and sage grouse habitat.

On the 9,800 acres recommended nonsuitable, a small section of the rim offering potential raptor nesting area and an area used minimally by bighorn sheep would remain subject to occasional disturbance from nearby vehicle use.

Conclusion: Wilderness designation of 14,800 acres would protect existing wilderness values with probable enhancement of those values. Within the 9,800 acres not designated wilderness, projected activities would impair wilderness values over approximately 930 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

This alternative would withdraw 14,800 acres from mineral entry. Mineral and energy exploration and development could occur on the 9,800 acres recommended nonsuitable for wilderness.

Energy Development

Lands recommended suitable, 14,800 acres, would be closed to energy exploration and development. The 9,800 acres recommended nonsuitable would remain open to energy exploration and development. A lack of energy resources with moderate or high potential for occurrence in the WSA indicates that any exploration would be casual, with no development anticipated.

Conclusion: No impact to energy development is expected.

Mineral Development

Exploration for diatomite on 2,100 acres of the 2,200 acres with moderate potential for diatomite (based on indirect evidence) would be precluded in the suitable area. However, due to the remoteness of the area, market conditions and availability of this resource in other areas in southeastern Oregon, only casual exploration without development is expected.

Surface-disturbing exploration for gold, silver, lead and antimony on 8,500 acres of 9,800 with moderate potential (based on indirect evidence) would be precluded.

The remaining 9,800 acres of the WSA would be open to mineral exploration and development, including 100 acres rated moderate for diatomite. Again, due to the remoteness of the area, market conditions and the availability of this resource in other areas in southeastern Oregon, no exploration, other than casual, without development, is expected. Geochemical and geophysical surveys for tin (low potential) would occur in The Basin. If such casual exploration resulted in direct evidence for the occurrence the resource, more extensive exploration involving drilling would be likely. Development could follow if minerals are present in sufficient quality and quantity, but none is projected based on current information.

Conclusion: No impact to mineral developement is expected. Mineral exploration for tin could occur in The Basin, while 2,800 acres would not be available for exploration for gold, silver, lead and antimony.

Impacts on Vegetation

Natural vegetation would be preserved in its present early and mid-seral stages in the portion recommended suitable. The closure of 2 miles of ways would allow for revegetation in 3 to 5 years.

In the portion of the WSA recommended nonsuitable, vehicle traffic on 11 miles of ways would prevent their revegetation, maintaining the current impact on 11 acres.

Conclusion: There would be little or no change, except that 2 miles of ways would revegetate on the area recommended suitable.

Impacts on Wildlife

Wildlife habitat for the 40 to 100 mule deer, 20 to 30 antelope and an undetermined number of sage grouse would be preserved in Orejana Canyon, on Orejana Rim and on The Island. Three guzzlers to provide water for bighorn sheep would be allowed under wilderness designation of these 14,800 acres. Removal of vehicle use on 2 miles of ways would decrease human disturbance of wildlife populations, including bighorn sheep, allowing for full utilization of habitat.

Wildlife habitat in the area recommended nonsuitable would continue to be impacted by vehicle use on 11 miles of ways for hunting as well as for management purposes.

Conclusion: Habitat for wildlife and their current population levels would be preserved and enhanced (through guzzlers) in the portion recommended suitable. In the nonsuitable portion, vehicle use impacts to wildlife would continue.

Impacts on Livestock Grazing

Livestock grazing use would remain at current levels of 777 AUMs. Vehicle use on 2 miles of ways would be excluded. Livestock management activities such as salting and checking livestock would be accomplished by horseback resulting in inconvenience to livestock operators. The road to Shingle Reservoir would remain open. Use of heavy equipment would be permitted every 6 to 10 years for maintenance of 3 reservoirs. A shift of 226 AUMs into the WSA from other portions of the allotment would not be realized due to the preclusion of a 960-acre burn-for-release project in the eastern portion of the WSA.

Grazing use on the 9,800 recommended nonsuitable for wilderness would remain at the current level of 311 AUMs. The 11 miles of ways within the nonsuitable portion would remain open to vehicle use for livestock management.

Conclusion: Livestock grazing use would remain at 777 AUMs. Exclusion of vehicle use for routine livestock management on 2 miles of ways would cause inconvenience to operators. The opportunity to shift 226 AUMs into the WSA would be foregone.

Impacts on Recreation Use

Primitive types of recreation, such as hiking and backpacking, would be likely to increase in the portion recommended suitable for wilderness, with the elimination of vehicle use on 14,800 acres. The reduced vehicle use would be offset by this increase in nonmotorized recreation use, resulting in a negligible impact on overall recreation use levels.

Vehicle-oriented recreation would not be restricted on the 9,800 acres recommended nonsuitable, maintaining current recreation use levels in this portion of the WSA.

Conclusion: Recreation use would not change from less than 100 visitor days per year, but use would change to primitive, non-motorized types of recreation in the portion recommended suitable. There would be no impact on the portion recommended nonsuitable.

Impacts on Local Personal Income

Livestock grazing would remain at 777 AUMs. Recreation use numbers are not expected to change. Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $10,300.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 24,600 acres

Impacts on Wilderness Values

The entire 24,600 acres of the Orejana Canyon WSA would not be designated wilderness and wilderness values on these acres would not receive special legislative protection.

Naturalness

Under the No Wilderness alternative, the natural aspect of the WSA would be altered by intensified livestock management in the northern portion due to a burn-for-release project on 960 acres. The increase in impacts to soils and vegetation around water sources and the reduction of residual ground cover resulting from the increase in livestock would visually influence approximately 1,250 acres, or 5 percent of the WSA. The placement of 3 guzzlers for bighorn sheep would disturb 0.3 acre each, and the visual impact is expected to influence fewer than 30 acres collectively.

None of the ways would revegetate, continuing an impact to naturalness on about 500 acres. Continued use of ways and possible extension of the ways from cross-country use would add to physical disturbance of the area's natural appearance, visually affecting approximately 900 acres in the northern and western portions of the WSA. The total area impacted by actions affecting naturalness in the WSA would increase from about 500 acres to 3,140 acres.

Solitude

Opportunities for solitude would continue to be impacted by vehicle use, particularly in The Basin where 11 miles of ways are used for livestock management activities and for hunting. Placement of guzzlers would temporarily and locally affect opportunities for solitude, as would the implementation of the 960-acre burn-for-release project.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would continue to be disturbed in the vicinity of motorized activity related to livestock management and vehicle-oriented recreation. This would be most noticeable in the northern and western portions of the WSA, affecting approximately 900 acres.

Special Features

The 960-acre burn-for-release would impact sage grouse habitat on those acres due to a change from shrub/grassland type to primarily grassland. Three proposed wildlife guzzlers to facilitate the expansion of bighorn sheep range into historic territory would be installed if deemed necessary.

Conclusion: In the absence of wilderness designation, projected activities would both directly and indirectly impair wilderness values over approximately 2,640 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire WSA would be open to energy and mineral entry.

Energy Development

The entire 24,600 acres would be open to energy exploration and development. However, since there are no energy resources with moderate or high potential for occurrence in the WSA, no exploration, other than casual, or development is expected.

Conclusion: There would be no impact on energy development in the WSA.

Mineral Development

The entire WSA would be open to mineral entry. Geochemical and geophysical exploration on the 2,800 acres with low potential for the occurrence of gold, silver, lead and antimony, would be expected. The same type of exploration would occur for tin (low potential) in The Basin. If data gained by these exploration warranted more extensive exploration, drilling would occur. Subsequent development of these resources is possible if minerals are located in sufficient quantity and quality, but none is projected.

Lack of geologic evidence for diatomite, coupled with the availability of this resource in less remote areas, does not justify an extensive exploration/development program. No exploration, other than casual, is therefore expected.

Conclusion: There would be no impact on mineral development in the WSA.

Impacts on Vegetation

Vegetative manipulation on 960 acres in the northeast portion of the study area would change the big sagebrush/Sandberg's bluegrass community to primarily Sandberg's bluegrass with squirreltail. The 226-AUM grazing increase would locally alter species occurrence and diversity on an additional 300 acres of the WSA. Placement of three wildlife guzzlers would remove less than 1 acre of vegetation. The 13 miles of ways would be maintained by the passage of vehicles, preventing their revegetation. Little or no change would take place to vegetative composition or ecological status on the remainder of the WSA.

Conclusion: Vegetation would be altered on approximately 1,260 acres.

Impacts on Wildlife

A burn-for-release project for livestock on 960 acres would improve deer and antelope habitat by providing early spring forage. It would also alter sage grouse habitat within this acreage by altering vegetative type. The installation of three guzzlers would benefit bighorn sheep habitat by providing additional water sources, which would also be available to other wildlife. Continued vehicle use on 13 miles of ways would disturb bighorn sheep and discourage full use of potential range for expansion as the reintroduction effort continues.

Conclusion: Deer and antelope habitat would improve on 960 acres; sage grouse habitat would decrease on the same acreage. Bighorn sheep habitat would be improved by the installation of guzzlers. Some local wildlife habitat degradation would accompany increases in livestock use.

Impacts on Livestock Grazing

Livestock use in the allotment would remain at the current use level of 777 AUMs. The 13 miles of ways and 0.5 mile of road within the WSA would remain open to vehicles for range management purposes. A 960-acre burn-for-release would be implemented to improve livestock forage, resulting in an increase in livestock use within the WSA by 226 AUMs. Other livestock management uses in the WSA, including reservoir and fence maintenance, would not change.

Conclusion: A shift of 226 AUMs of livestock forage within the allotment would be realized.

Impacts on Recreation Use

Vehicle-oriented recreation, primarily associated with hunting, would continue on 24,600 acres, primarily on 13 miles of ways. Primitive types of recreation activities would be constrained by the continuance of nonprimitive forms of recreation, particularly in the north portion of the WSA where most of the ways are located. Overall recreation use levels are not expected to change.

Conclusion: Recreation use would be expected to remain at less than 100 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would increase by 226 AUMs within the WSA. Recreation use numbers are not expected to change. Table 5 shows the effects on local personal income generated from resource outputs in the WSA. There would be an increase in local personal income of approximately $2,700.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase to approximately $13,000.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (Partial alternative), mineral exploration would be foregone and vehicle use would be precluded on 14,800 acres, with a slight inconvenience to livestock operators from the closure of 2 miles of ways.

In the 9,800 acres recommended nonsuitable, a 960-acre burn-for-release project, a 226-AUM increase in livestock use and placement of three wildlife guzzlers would lead to unavoidable adverse impacts to wilderness values as a result of approximately 960 acres of surface disturbance which visually influences an additional 330 acres.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

The partial wilderness alternative would ensure preservation of the long-term productivity of wilderness values on 14,800 acres. In the nonsuitable portion of the WSA, all short-term uses would continue and future development options, including projected range development and grazing increases, would remain open. Long-term productivity of wilderness values would be directly lost on 960 acres with surface and vegetative disturbance from projected vegetative manipulation, increased livestock grazing and placement of three guzzlers, and indirectly lost on an additional 330 acres due to visual influences, with further declines from other uses over the long term.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

In the 9,800 acres recommended nonsuitable, range and wildlife projects would result in an irreversible commitment of the pristine wilderness character of the area on 960 acres.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The Orejana Canyon WSA is capable of being managed as wilderness under both the all wilderness and partial wilderness alternatives. If no alternative to vehicle access under permit for certain livestock management activities could be found, the use of vehicles could temporarily have negative impacts locally on opportunities for solitude and primitive recreation, as well as short-term impacts on natural features such as damage to vegetation from vehicle passage.

Rationale for the Selection of the Proposed Action

The Partial alternative has been selected as the Proposed Action because it would preserve the high wilderness values in the Orejana Canyon area and on The Island between the Rim and the Canyon.

In the area recommended nonsuitable, the benefits of preserving wilderness qualities would be outweighed by leaving the area open for development of resources for livestock, including an increase of 226 AUMs, and the use of motorized vehicles for recreation and routine livestock management, which would be incompatible with wilderness management.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to the Orejana Canyon WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: The effect of the proposed seeding on raptor hunting grounds should be analyzed. **Response:** The proposed seeding referred to in the Draft EIS has been moved to an area outside the WSA.

Comment: The burn-and-seed is not a wildlife project. **Response:** See response to comment above regarding the seeding. The burn-for-release project is now identified as a livestock project.

Comment: The document does not explain why bighorn sheep use the WSA in the spring. **Response:** The movement to the lower elevation of Orejana Canyon is due to the availability and accessibility of forage.

Comment: Archeological and geological features data from the Unit Resource Analysis should be included in the EIS. **Response:** While a general acknowledgment of cultural values in the WSA is included in the appendix, specific information regarding the presence and location of archeological sites is not included for the protection of those sites. Geologic features of the Orejana Canyon WSA include obsidian and a fossil-bearing layer exposed by faulting.

Comment: A perennial stream previously existed in the canyon, but was destroyed by overgrazing in the riparian zone. **Response:** The EIS analyzed impacts of projected actions as they affect the current situation. While it may be true that stream flow has been altered by grazing, wilderness designation would allow continued livestock grazing at current levels and none of the alternatives would have an effect on this situation.

Table 1. Summary of Proposed Management Under Each Alternative, Orejana Canyon WSA (OR-1-78)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	24,600	14,800	0
Acres Closed to ORVs by Wilderness Designation	24,600	14,800	0
Miles of Ways Closed	13	2	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	24,600	14,800	0
Structural Wildlife Projects Developed: Guzzlers (number)	3	3	3
Vegetative Manipulation for Livestock: Brush Control without Seeding (acres)	0	0	960

Table 2. Summary of Environmental Consequences of Alternatives, Orejana Canyon WSA (OR-1-78)

Resource or Activity	All Wilderness	Partial (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 24,600 acres would result in protection and enhancement of existing wilderness values.	Wilderness designation would protect and enhance existing wilderness values on 14,800 acres. Projected actions would impair wilderness values on 930 acres of the 9,800 acres nonsuitable for wilderness.	Projected management actions would impair the area's naturalness, solitude and recreation opportunities and special features over 2,640 acres.
Energy and Mineral	No impact.	Exploration for tin in The Basin is expected.	Exploration for gold on 2,800 acres and for tin in The Basin is expected.
Vegetation	Little or no change to existing vegetation. Nine miles of ways would revegetate and 4 miles of ways would partially revegetate.	Little or no change to existing vegetation. Two miles of ways would revegetate.	Vegetation altered on 960 acres by burn-for-release. A 226-AUM grazing increase within the WSA would reduce residual ground cover on 300 acres. Placement of 3 guzzlers would remove less than 1 acres of vegetation. Total impact approximately 1,260 acres.
Wildlife	Habitat and populations would be maintained and habitat for bighorn sheep would be enhanced by the placement of 3 guzzlers.	Habitat and populations would be maintained and habitat for bighorn sheep would be enhanced by the placement of 3 guzzlers.	Deer and antelope habitat would improve on 960 acres; sage grouse habitat would decrease on 960 acres. Bighorn sheep habitat would be enhanced by the placement of 3 guzzlers. Some local habitat would be degraded by increase in livestock use.
Livestock	Shift of 226 AUMs into WSA foregone. Restricted use on 13 miles of ways would cause some inconvenience to livestock operators.	Shift of 226 AUMs into WSA foregone. Restricted use of 2 miles of ways would cause a slight incovenience to livestock operators.	Shift of 226 AUMs into WSA would be realized by a 960-acre burn-for-release project.
Recreation Use	Use numbers would not change, but types of activity would shift from motorized to primitive types of recreation.	Same as all wilderness for suitable 14,800 acres. No impact to nonsuitable portion.	Use numbers would not change.
Local Personal Income	Local personal income generated from resource outputs in the WSA would remain at approximately $10,300 per year.	Local personal income generated by resource outputs would remain at approximately $10,300 per year.	Annual local personal income generated by resource outputs would increase by approximately $2,700.

Table 3. Classification of Energy and Mineral Potential, Orejana Canyon WSA (OR-1-78)

Commodity	Area	Level of Potential	Level of Certainty
Metals (gold, silver, lead and antimony)	See Map 4	L	B
	Rest of WSA	0	B
(tin)	See Map 4	L	B
	Rest of WSA	0	B
Geothermal	Entire WSA	L	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	0	A
Bentonite	Entire WSA	0	A
Diatomite	See Map 4	M	B
	Rest of WSA	L	B
Zeolites	Entire WSA	L	B
Perlite	Entire WSA	L	B

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

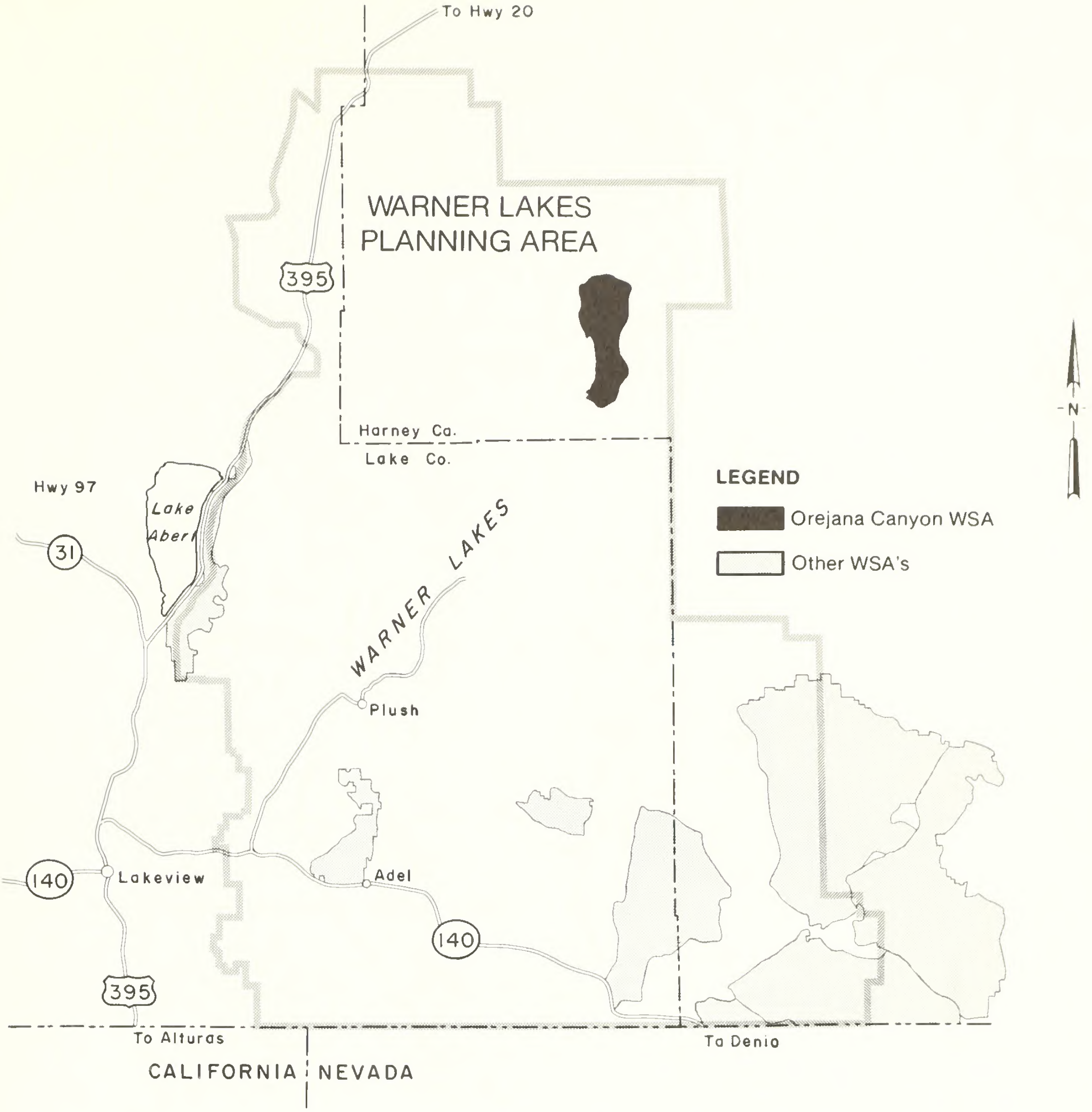
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

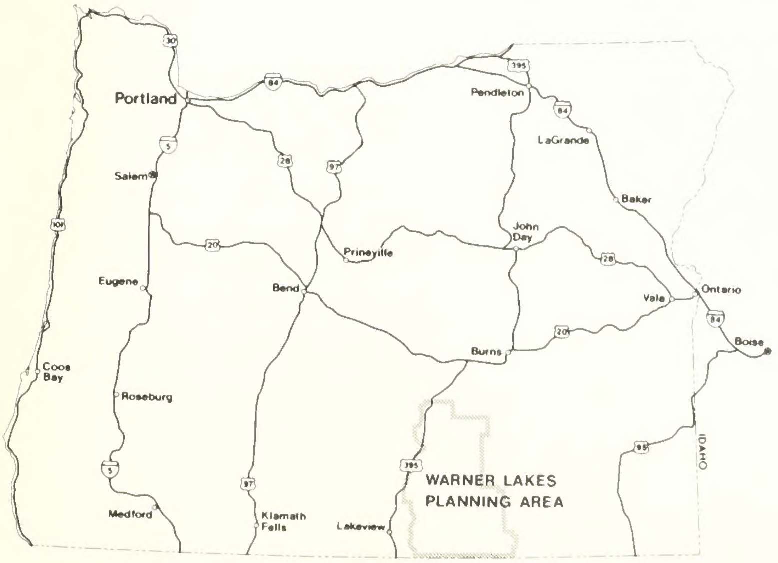
Table 4. Existing Livestock Use, Orejana Canyon WSA (OR-1-78)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Northeast Warner (No. 511)	5,956	02/01-09/30	7.3	435
North Bluejoint (No. 512)	289	05/01-07/31	0.7	2
Orejana Rim (No. 510)	1,423	04/01-10/31	23.9	340
Total	7,668			777

Table 5. Effects of Alternatives on Local Personal Income, Orejana Canyon WSA (OR-1-78) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	no change	no change	+226
Recreation Use	RVD	no change	no change	no change
PERSONAL INCOME FROM PROJECTED CHANGES				
Livestock Grazing	$	0	0	+2,700
Recreation Use	$	0	0	0





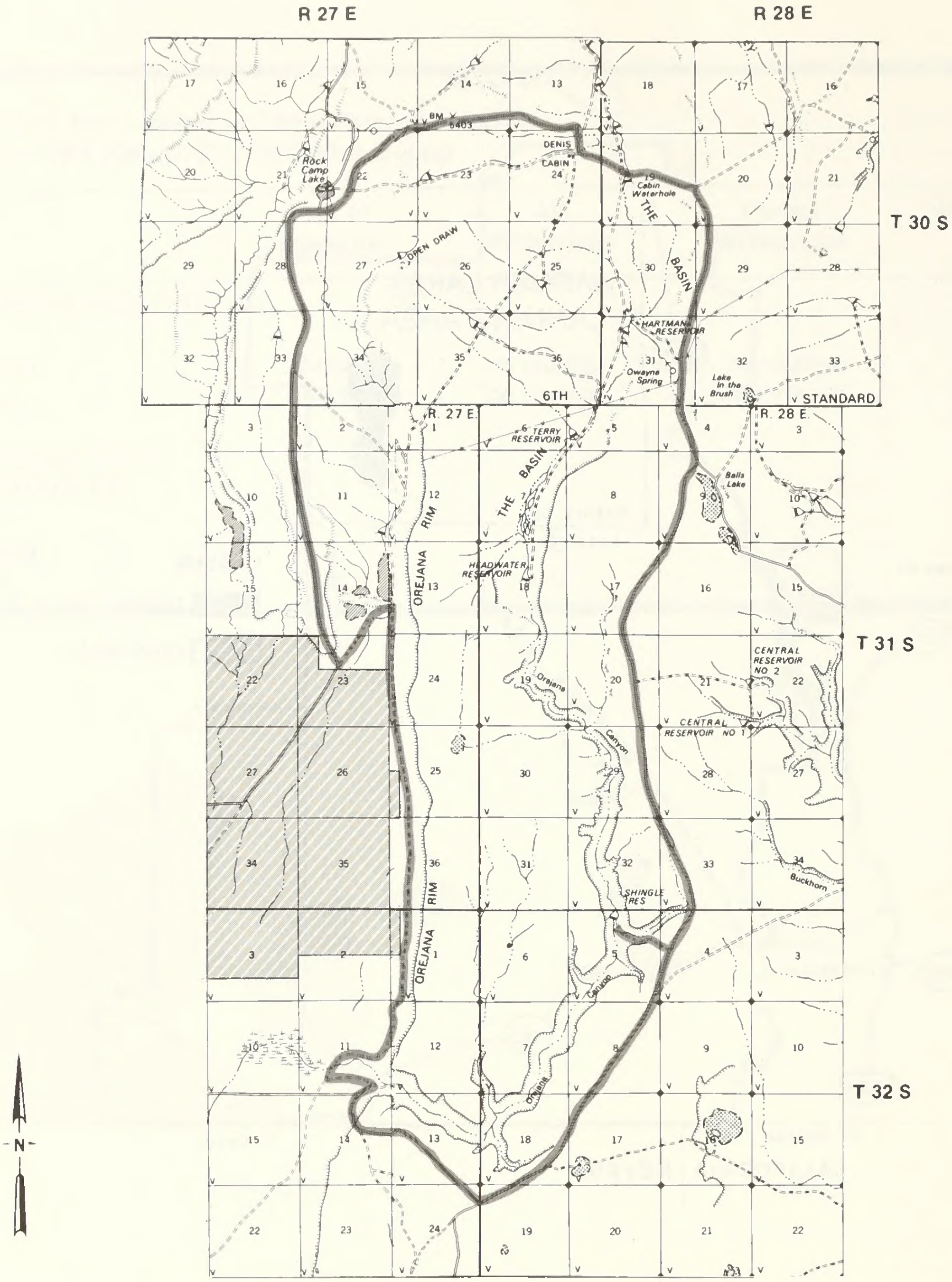
U. S. Department of the Interior
Bureau of Land Management
Lakeview District

Orejana Canyon WSA
OR-1-78

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

— Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

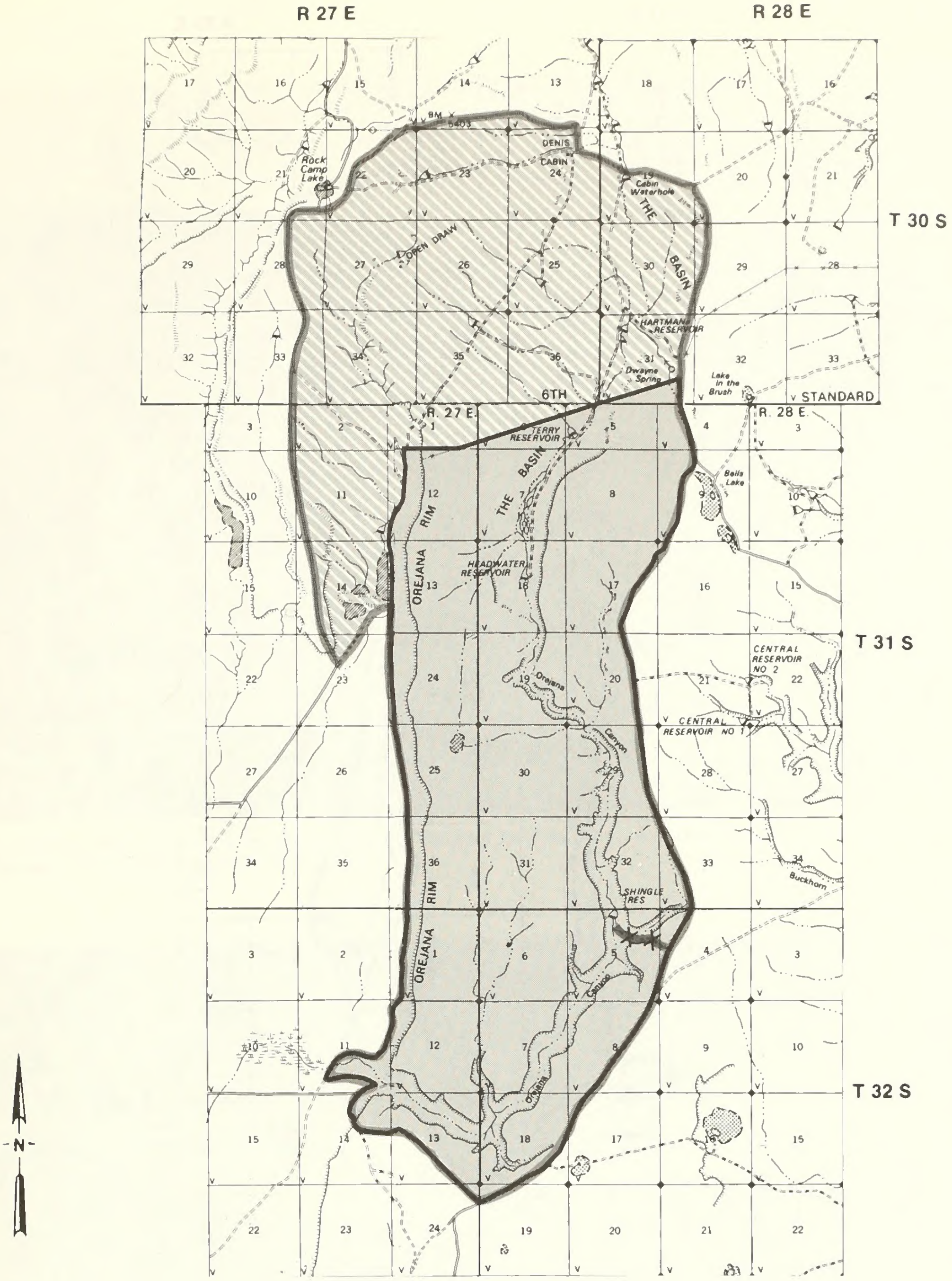
U. S. Department of the Interior
Bureau of Land Management
Lakeview District

Orejana Rim WSA
OR-1-78

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

✕═✕ Recommended Road Closure

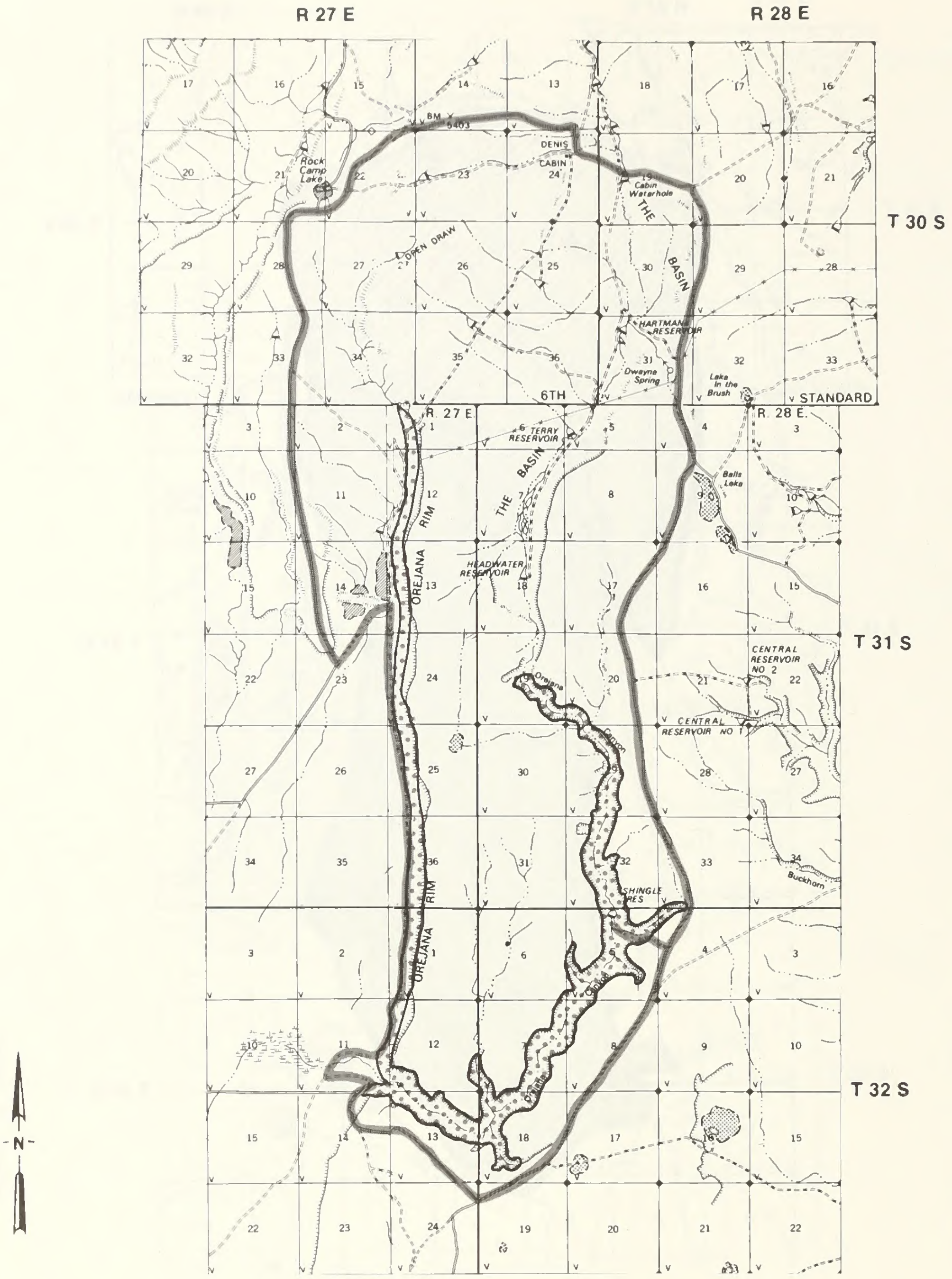
U. S. Department of the Interior
Bureau of Land Management
Lakeview District

Orejana Rim WSA
OR-1-78

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



▨ **Moderate Potential (MB) for Diatomite**

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Bureau of Land Management
Lakeview District

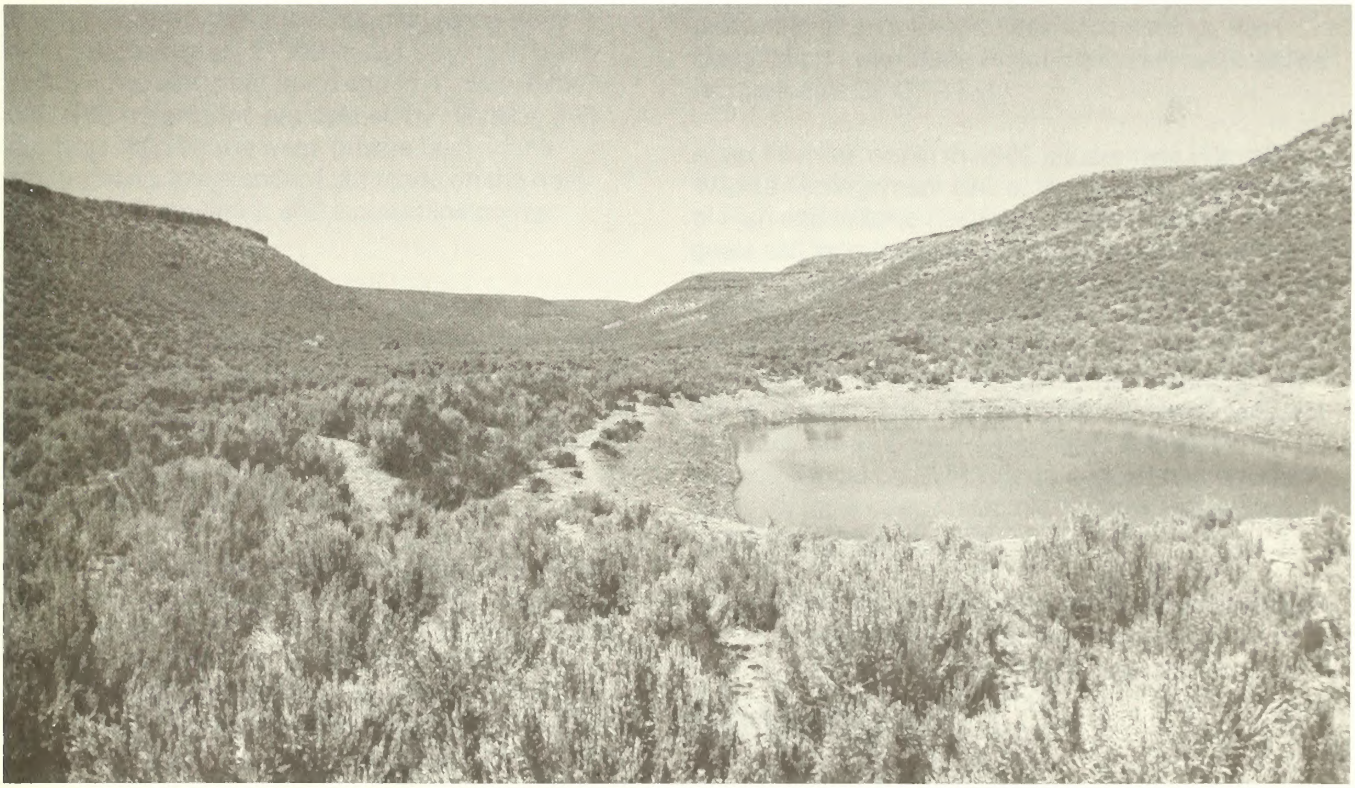
Orejana Rim WSA
OR-1-78

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Orejana Canyon, WSA, OR-1-78. Mouth of Orejana Canyon looking west. Within area recommended suitable under the partial (proposed action) alternative. May 1982.



Orejana Canyon WSA, OR-1-78. Looking north up Orejana Canyon from Shingle Waterhole. Within area recommended suitable under the partial alternative (proposed action). Shows a range development which does not impair wilderness qualities. August 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Abert Rim Wilderness Study Area (OR-1-101)

1. Introduction

General Description of Study Area

The Abert Rim Wilderness Study Area (WSA) is located 26 miles north of Lakeview, Oregon and 3 miles northeast of Valley Falls, in Lake County (see Map 1). U.S. Highway 395 forms the west boundary of the WSA.

The study area contains 23,760 acres of public land, including 480 acres of split-estate land (see Map 2). The WSA is long and narrow, running along Abert Rim for approximately 21 miles and varying in width from 1.5 miles along the north end to 4 miles in the south. The boundaries are defined by Highway 395 and private land on the west, private land on the south, primarily low standard dirt roads on the east (and some private land), and a powerline on the north.

The WSA is dominated by Abert Rim, a high, west-facing fault scarp rising above Lake Abert. Abert Rim is one of the largest continuous fault scarps on the North American continent, rising over 2,000 feet above the valley. The top of the rim is characterized by gently-sloping plateaus. Several intermittent creeks, ponds and springs occur in the WSA.

Vegetation in the WSA varies from salt-desert shrub communities with stringers of mountain mahogany, juniper, aspen and ponderosa pine along the uplands. The ponderosa pines are an isolated stand of trees known as "Colvin Timbers" located approximately 5 miles north of Fremont National Forest in the southeast portion of the WSA. These trees are the most northerly location of ponderosa pine in the Warner Mountains.

Interrelationships

U.S. Highway 395, at the base of Abert Rim, is an Oregon State Scenic Route. This designation provides no official protection to adjacent lands.

The south end of the WSA abuts the Fremont National Forest. The adjacent Forest Service lands are no longer under wilderness review.

A portion of the WSA below the rim and along Highway 395 is an archeological district on the National Register of Historic Sites and Places, which recognizes areas of especially high archeologic value. No special protection beyond that afforded by laws protecting all archeologic sites accompanies this designation (refer State Historical Preservation Office requirements 36 CFR 800).

Abert Rim lies within the 960 square-mile Warner Wildlife Management Unit of the Oregon Department of Fish and Wildlife (ODFW). ODFW management goals call for a total of 8,600 deer in the unit with a buck to doe ratio of 12/100 and a fawn survival of 35/100 does. A portion of the WSA is crucial winter range for 500 to 1,000 mule deer. A resident herd of 50 to 60 California bighorn sheep range throughout the WSA, and up to 150 pronghorn antelope frequent the study area. Cooperative efforts with ODFW provide habitat on BLM land to support management goals for mule deer, California bighorn sheep and nongame wildlife species.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources selected as issues specifically for analysis in the WSA include:

- impacts on wilderness values,
- impacts on energy and mineral development,
- impacts on mule deer and bighorn sheep habitats and populations, and
- impacts on timber harvest in Colvin Timbers,

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness (proposed action)
- no wilderness/no action

Alternatives combining this WSA with other inventory units not brought forward in the review process are beyond the scope of this EIS which analyzes suitability or nonsuitablity for areas meeting the wilderness inventory criteria. A partial alternative is not analyzed because there are no viable opportunities to resolve conflicts with other resource uses by recommending only part of the study area as suitable.

All Wilderness (Proposed Action)

The all wilderness alternative would recommend all 23,760 acres of public land in the WSA, including 480 acres of split-estate lands, suitable as wilderness (see Map 2). For purposes of analysis, this alternative assumes that the mineral estate of the split-estate lands would not be acquired.

Energy and Mineral Development Actions

Under this alternative, 23,280 acres would be closed to mineral entry. The split-estate land, 480 acres, would be open to mineral entry. Due to a lack of geologic evidence to support an intensive minerals exploration or development program, only casual exploration on the split-estate lands are projected.

Exploration for geothermal resources which have a moderate potential based on indirect evidence would be prohibited on 23,380 acres. Due to location of the split estate and only indirect evidence to support potential, only casual exploration for geothermal resources is projected on split-estate lands.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals for game and nongame wildlife. Habitat would be managed to support the herd of California bighorn sheep at or above the present herd number of 50 to 60. Pronghorn antelope numbering up to 150 frequent the sage flats above the rim. The portion of the Warner Management Unit deer winter range habitat which lies within the WSA would be managed in cooperation with ODFW to support an average of approximately 750 deer annually, primarily through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Six wildlife guzzlers would be maintained using horseback or foot travel for access. No wildlife projects are proposed.

Livestock Management Actions

Licensed livestock use would remain at the current level of 708 AUMs for the portions of five grazing allotments within the study area. The seasons of use and licensed AUMs are identified in Table 4. Six miles of ways would be closed to vehicles. Heavy equipment would be used once every 10 years to maintain reservoirs and waterholes. Three spring developments and 3 miles of fence would be maintained using horses or foot travel for access. No new livestock developments are proposed. Salting and checking livestock would be accomplished by horseback.

Wood Products Harvest Actions

Mortality salvage of timber on approximately 600 acres of forested land in the Colvin timbers would be precluded under this alternative.

Recreation Management Actions

The entire 23,760 acres would be closed to vehicle traffic, closing 6 miles of vehicle ways. The WSA would also be closed to hang gliding under this alternative. Current recreation use is estimated to be between 1,000 and 1,500 visitor days per year below the rim, and approximately 600 visitor days per year above and to the east of the rim. The Abert Rim geologic marker/interpretive sign along Highway 395 is visited by approximately 60,000 people annually. There are no recreation projects proposed in the WSA.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the continuation of the present situation.

Energy and Mineral Development Actions

The entire 23,760 acres would be open to mineral exploration and development. No activity beyond casual exploration is expected as geologic evidence does not support mineral development. Moderate geothermal potential based on indirect evidence could lead to casual exploration, but due to scenic designation, the archeological district and lack of evidence to support an intensive exploration/development expenditure, development is not projected.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to maintain the herd of bighorn sheep at or above the present herd number of 50 to 60. Pronghorn antelope numbering up to 150 frequent the sage flats above the rim. The portion of the Warner Management Unit deer winter range which lies within the WSA would be managed in cooperation with ODFW to support an average of approximately 750 deer annually through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Six wildlife guzzlers would be maintained using vehicles, horseback or foot travel for access. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the current use of approximately 708 AUMs. A reservoir would be constructed in the area south of Mule Lake to enhance livestock distribution and allow improved management. The entire 23,760 acres would be open to vehicles for livestock management purposes. This use is limited almost exclusively to the 6 miles of ways within the WSA. Heavy equipment would be used once every 10 years for maintenance of 14 reservoirs and waterholes. Three spring developments and 3 miles of fence would be maintained using vehicles, horses, or foot travel for access. No new livestock projects are proposed.

Wood Products Harvest Actions

Conventional timber sales are not proposed in the area. Mortality or salvage timber harvest in Colvin Timbers would be allowed in the event of disease or insect infestation. Salvage would require conversion and maintenance of approximately 3 miles of way in the WSA to logging road and reconstruction of roads outside the WSA for access to 591 acres of ponderosa pine.

Recreation Management Actions

The entire area would be open to recreation vehicle traffic, including the 6 miles of ways within the WSA. Hang gliding would be permitted. Current recreation use within the WSA below the rim is estimated to be between 1,000 and 1,500 visitor days per year; above the rim, approximately 600 visitor days per year. The Abert Rim geologic marker/interpretive sign on Highway 395 attracts approximately 60,000 visitors annually.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Overall, the Abert Rim WSA is in a natural condition. Vegetation in the WSA is in good condition and there is a variety of vegetative communities. The topography and vegetation help to mask any signs of human activity in the WSA. The unnatural features in the WSA are generally small, scattered and not visible from a great distance.

The developments in the WSA include 14 stock reservoirs and waterholes, six guzzlers, three spring developments, 3 miles of fence and 6 miles of vehicle ways. Water developments in the WSA are in most cases very small or difficult to locate. Only the development at Mule Lake effects more than 2 acres, with a visual impact on approximately 80 acres. Total area influenced by developments other than ways is less than 200 acres, approximately 1 percent of the WSA. The 6 miles of ways visually influence the naturalness of about 1,700 acres.

The Colvin Timbers area was selectively logged in the 1950's. Scattered stumps and a few vehicle ways (constructed for timber removal but not maintained, therefore not classified as roads) remain as evidence of past logging activity. Many of the ways have overgrown to the point of not being locatable. Most of the Colvin Timbers area is covered with trees, dense shrubs and herbaceous species.

Perceived natural conditions of the area adjacent to Highway 395 can be affected by outside sights and sounds from traffic on the highway and material storage areas within the highway right-of-way. The powerline right-of-way forming the northern boundary is visible from within the WSA, but its impact is not significant.

A wildfire burned approximately 3,000 acres of the scarp in the southern end of the WSA in 1985. The burned area is revegetating naturally with native bunchgrasses at higher elevations. Along the road and at lower elevations, Mediterranean sage (a noxious weed) is making substantial incursion.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude are excellent in the WSA, especially in the southern half, both on the rim and along portions of the scarp. Here deeply-incised side canyons, foothills at the base of the scarp, and vegetative screening all help to isolate the visitor. The northern half of the WSA (north of Mule Lake) and the portion along the Highway 395 right-of-way offer less solitude due to the narrowness of the WSA on top of the rim, the lack of isolating land form, lower height of vegetation and proximity to noise from the highway.

Primitive and unconfined types of recreation are abundant in the WSA. Hiking, backpacking, hunting, camping, sightseeing, photography, wildlife observation and horseback-riding opportunities are all excellent within the WSA. The visitor is rewarded with outstanding views, abundant wildlife, a variety of geological features and a wide array of plants. Hiking can vary from flat, easy terrain on top, to steep terrain on the scarps and in the canyons, such as along the undeveloped and rugged Poison Creek hiking trail which follows the stream drainage up the slope.

Due to the exhilarating scenic views, the variety of topography, the abundance of game and nongame wildlife species, the wooded areas and springs, recreation opportunities are outstanding.

Special Features

Abert Rim is best known as one of the largest continuous fault scarps in North America. The scarp, which shows little erosion, rises an average of over 2,000 feet above Lake Abert.

Abert Rim is a major scenic feature and landmark in the area and can be seen from both Highway 395 and Highway 31 for many miles. Highway 395 is a designated State Scenic Highway route. The WSA exhibits outstanding scenic qualities, both above and below the rim.

A major portion of the WSA has been designated as an archeological district on the National Register of Historic Sites and Places because of the presence of high archeological values along the ancient shoreline of Lake Abert. Some archeological sites near ways in the WSA have shown signs of vandalism or vehicle damage.

Colvin Timbers, an isolated group of ponderosa pines on 600 acres, represents the northernmost extension of ponderosa pine in the Warner Mountains.

The WSA supports a herd of California bighorn sheep, a candidate species for Federal listing as threatened or endangered in Oregon. The herd was introduced in 1974 to help perpetuate the species and now exceeds 60 in number allowing limited hunting to occur each year. The entire WSA provides bighorn sheep habitat. The WSA is also within crucial deer winter range. The northern two-thirds of the rim is an important nesting area for prairie falcon, golden eagle, great-horned owl and red-tailed hawk.

The WSA is used yearly for both educational and scientific purposes by geology and archeology students.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, Abert Rim WSA is located in the Intermountain Sagebrush Province with a potential natural vegetation of saltbush-greasewood along the western edge and sagebrush steppe in the rest of the WSA. The area is adjacent to the ponderosa/shrub forest-type to the south and includes a small portion of this community at Colvin Timbers.

Vegetative communities listed in the Basin and Range section of the Oregon Natural Heritage Plan occurring in the WSA are: ponderosa pine savanna, western juniper/big sagebrush/bluebunch wheatgrass, big sagebrush/bluebunch wheatgrass, big sagebrush-greasewood, big sagebrush-bitterbrush/Idaho fescue, bitterbrush-sagebrush-snowberry, low sagebrush/Sandberg's bluegrass, silver sage, big sagebrush-spiny hopsage and mountain mahogany.

Abert Rim is located within 5 hours' driving time of three standard metropolitan statistical areas with populations over 100,000: Eugene/Springfield and Medford, Oregon, and Redding, California.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and data provided by TERRADATA, a consulting firm under contract with BLM. The data is contained in a report titled "Assessment of Geology, Energy and Minerals Resources of the Abert Rim Geologic Resource Area." Data from a U.S. Bureau of Mines report entitled "Mineral Resources of the Abert Rim Wilderness Study Area, Lake County, Oregon" has been incorporated into this appendix. Based on rock chip samples and inductively-coupled plasma methods, USBM concluded that the potential for accumulations of metals within the WSA is low.

The WSA is within the Abert Rim geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the mineral potential classifications for the WSA.

Surface rocks of the WSA are primarily continental Tertiary basalt flows and tuffaceous sedimentary rocks. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

Current data do not indicate the presence of oil and gas or geothermal reserves in economic quantities within the WSA. Because of above-normal heat flow and the presence of nearby thermal springs, there is a moderate potential for the occurrence of usable geothermal energy. Because of the likelihood of marine sedimentary rocks at depth, the area is considered to have a low potential for the occurrence of oil and gas. However, there has been no deep drilling in this area. As of October 16, 1987, there were no oil and gas, and no geothermal leases within the Abert Rim WSA.

Mineral Resources

Based on available data, it is not postulated that exploration and development of mineral resources would be economically feasible within the WSA. Recent data collected by the U. S. Bureau of Mines has resulted in a lowering of the potential for metals (gold, silver, mercury) to low potential from the moderate rating given in the Draft EIS. There were 30 mining claims within the Abert Rim WSA as of October 16, 1987.

Vegetation

Vegetation in the WSA represents a wide variety of plant communities. Salt-desert shrub communities occur along the shores of Lake Abert grading into sagebrush-bunchgrass communities up the scarp. Stringers of aspen, mountain mahogany and juniper occur with dense shrubs and bunchgrasses throughout portions of the southern half of the WSA. One stand of ponderosa pine (Colvin Timbers) covers approximately 600 acres. The northern portion of the WSA on top of the rim contains numerous low sagebrush communities.

The vegetative communities in the WSA vary from early seral in the big sagebrush communities along the base of the scarp along Highway 395 to potential natural community condition in the big sagebrush/bluebunch wheatgrass communities at the top of the scarp. Colvin Timbers represents an old-growth ponderosa pine community.

Wildlife

The southeastern quarter of the WSA (below the rim and south of Poison Creek) is crucial deer winter range for a portion of the Crooked Creek deer herd. Depending upon the severity of the weather, 500 to 1,000 deer use this portion of their range at some time during the winter. Deer population has exceeded ODFW management goals; increased harvest during hunting seasons has been implemented to reduce herd numbers. The herd condition is good, however the potential for increased mortality during stress years is high. The grazing allotment included in this crucial winter range has no forage allocated to livestock at this time. All existing forage is available to wildlife. No wildlife projects are proposed in the WSA.

The entire WSA is California bighorn sheep range. The South Abert Rim bighorn sheep herd represents a very successful reintroduction that began in the mid-1970's. Currently, this herd numbers 50 to 60 individuals, and there is significant interchange with the parent population on Hart Mountain and with another small herd in the Grays Butte/North Abert Rim area. This northern herd appears to have been reestablished naturally from migrants coming from both Hart Mountain and South Abert Rim.

The basalt scarp of the northern two-thirds of the WSA (north of Juniper Creek) is an important raptor nesting area. Prairie falcon densities average about one nest per mile of rim, and golden eagle nests average about twice that. Throughout this portion of the rim, there are also nesting sites of great horned owl and red-tailed hawk.

There is a wide variety of animals in the WSA due to a diversity of vegetative communities and topographic features and few developments in the area. The WSA is habitat for up to 150 pronghorn antelope, as well as for bobcat, coyote and badger; rattlesnakes, lizards and other reptiles; toads; burrowing, saw-whet and barn owls; sage grouse (category II Candidate for Federal listing as threatened or endangered species), chukar, quail, common flicker, kingbirds and phoebes, swallows, mountain bluebird, downy and hairy woodpecker, Williamson's sapsucker and a variety of songbirds. There is a possibility that cougar may frequent the study area.

There are six wildlife guzzlers within the WSA. Four of the guzzlers are located on the scarp and two are on the rim.

Watershed

The spring at the head of Poison Creek flows for a distance of at least 500 feet along the surface year round, with seasonal fluctuations. Juniper Creek also is a perennial spring at the rim, but it is smaller than the one at Poison Creek. Water quality is good for both springs.

Livestock Grazing

Portions of five grazing allotments are within the Abert Rim WSA. Table 4 shows existing livestock use in AUMs and season of use. The Paisley Common allotment along the western edge of the WSA below the rim is large, with widely separated individual pastures. There is no allocation of forage for livestock at this time.

Existing livestock projects in the WSA (among the developments mentioned in the Naturalness section) include 14 reservoirs or waterholes, three spring developments and 3 miles of fence.

Vehicles are occasionally used in the WSA to salt livestock and for fence maintenance. Most livestock management, such as inspection and gathering, is done on horseback due to the rough terrain in the WSA.

Wood Products Harvest

There are 600 acres of commercial forest land in the Colvin Timbers, containing 3 million board feet of ponderosa pine, near the boundary in the southern end of the WSA. The area is excluded from planned timber harvest in the existing land use plan, but could be subject to a mortality-salvage program resulting from disease or insect infestations. Existing vehicle access is badly eroded and would need extensive reconstruction or relocation prior to logging. About 3 miles of the existing access is within the WSA.

Recreation Use

Due to the spectacular scenery along Abert Rim, sightseeing from the highway right-of-way is the most common, generally passive, type of recreation related to the WSA. As many as 60,000 visits annually result from vehicle stops at the interpretive sign on Highway 395.

Between 1,000 and 1,500 visitor days annually can be attributed to the hunting of deer, antelope, bighorn sheep and upland game birds in the WSA. Hunting by horseback or on foot are the methods most suited to the area. The vehicle ways in the WSA and east boundary road are very rough, thus vehicle use is limited, even on the east boundary road and 6 miles of ways inside the WSA.

Abert Rim is considered one of the most spectacular and challenging hang-gliding sites in Oregon. Access is very limited, and the gliders must be hand carried to the edge of the rim from the WSA boundary road just north of the Fremont Forest boundary. Hang gliding use is 30 visitor days per year.

Other recreation use includes hiking, horseback riding, camping, photography and nature study. The Poison Creek Hiking Trail, which follows the stream drainage up the steep face of the rim from Highway 395 to the top of the rim, receives moderate recreation use by hikers. These activities collectively account for approximately 500 visitor days per year.

Total active recreation use of the area is estimated to be between 1,600 and 2,100 visitor days per year. Additional passive use by sightseers viewing the rim from the highway is approximately 60,000 visits per year.

Recreation use, including hunting, hiking, fishing and camping, is high on the Fremont National Forest just south of the WSA. The ruggedness of the road beyond the Forest Service boundary limits use by the public of BLM land to the north.

Local Personal Income

Livestock use at the current level of 708 AUMs and recreation use totaling 2,100 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $8,496 for livestock grazing, and $25,200 related to recreation use of the WSA, for an overall total of $33,696. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in the Abert Rim WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness (Proposed Action)

Recommended suitable for wilderness: 23,760 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The all wilderness alternative would designate 23,760 acres as wilderness. Wilderness values of naturalness, solitude, primitive and unconfined recreation, as well as special features, including the scenic values of one of the largest continuous fault scarps on the North American continent, Abert Rim, would be protected.

Naturalness

The naturalness of the Abert Rim WSA would be preserved and enhanced under the all wilderness alternative. Six miles of ways, influencing approximately 1,700 acres, would be closed to vehicle traffic allowing for revegetation and eventual disappearance of these intrusions in approximately 5 years. The use of heavy equipment to maintain 14 reservoirs and waterholes once every 10 years would not prevent the revegetation of these ways.

Solitude

Opportunities for solitude would be increased by the restriction of vehicle traffic, particularly in the southern portion of the WSA above the rim. The impact of outside sights and sounds associated with Highway 395 would remain.

Primitive and Unconfined Recreation

Closure of the 23,760-acre WSA to motorized recreation use, affecting 6 miles of ways, would enhance the esthetic value of primitive recreation setting in the southern portion of the WSA above the rim. A more natural, wild setting would be provided for such activities as hunting, hiking, photography and sightseeing.

Special Features

The many special features of the Abert Rim WSA would be given legislative protection under the all wilderness alternative. The rugged, steep slopes of one of the largest continuous fault scarps in North America, Abert Rim, and the scenic qualities for which Highway 395 was named an Oregon State Scenic Route, would be protected in its present natural condition. The superb bighorn sheep habitat and raptor nesting areas inherent to the rim and scarp would also be protected, as would crucial mule deer winter range and habitat above the rim for sage grouse. Lake Abert Archeological District would be given legislative protection under the Wilderness Act such as the prohibition of development and vehicle use, which enhances the protective measures provided by listing on the National Register of Historic Sites and Places.

The Colvin Timbers, an isolated stand of old-growth ponderosa pine, would be retained in natural condition. Diseased or insect infested trees would be removed only if there was a threat to timber outside the WSA.

Conclusion: Wilderness designation would protect existing wilderness values on 23,280 acres and enhance wilderness values on 1,700 acres through rehabilitation of 6 miles of ways.

Impacts on Energy and Mineral Development

Wilderness designation would withdraw 23,280 acres from all appropriations user mining and mineral leasing laws. The 480 acres of split-estate lands would remain open to mineral exploration.

Energy Development

Under the all wilderness alternative, 23,280 acres would be closed to energy exploration and development, although no such activity is projected due to only indirect evidence of potential and existing environmental constraints placed on the area by the scenic designation and National Register designation due to archeologic values.

Conclusion: No impact on energy development is expected.

Mineral Development

Mineral entry would not be allowed on 23,280 acres within the WSA. Recent U.S. Bureau of Mines findings indicate only low potential for minerals. Casual exploration is anticipated on split-estate. Due to the low potential based on geologic evidence, development is not anticipated in the area.

Conclusion: No impact on mineral development is expected.

Impacts on Vegetation

Vegetative composition as described in the Vegetation section in the Affected Environment would not be changed under this alternative. Ecological status, which is mainly mid-seral to potential natural community stage, would also not change. The stand of old-growth ponderosa pine (Colvin Timbers) would be retained in a natural condition.

The 6 miles of ways, once closed to vehicles, would revegetate in approximately five years.

Conclusion: No substantial change in existing vegetation would occur except for revegetation of 6 miles of way in the WSA.

Impacts on Wildlife

Wildlife habitat for approximately 60 bighorn sheep would be preserved in the area, and enhanced by the closure of 6 miles of ways to vehicle access resulting in less human disturbance. This closure would also seasonally decrease the impact of vehicle presence on antelope herds on the flat land above the rim. The crucial deer winter range supporting 500 to 1,000 mule deer would be preserved, as would the raptor nesting habitat on the scarp. Habitat for 50 to 60 California bighorn sheep would be protected from disturbance from vehicles on 6 miles of ways.

Conclusion: Wildlife habitat and populations would be maintained in the WSA, with enhancement of bighorn sheep and pronghorn habitat.

Impacts on Watershed

Water quality and water supply associated with the two perennial springs would not change. Spring developments and guzzlers would be maintained using horseback or foot travel for access.

Conclusion: No change to watershed would occur.

Impacts on Livestock Grazing

Livestock use would remain at the current authorized use level of 708 AUMs in the WSA. The proposed reservoir designed to improve livestock distribution would not be allowed because the disturbance of vegetation and the impairment of natural values related to its construction would impair wilderness values. The existing 14 reservoirs or waterholes would be maintained by heavy equipment approximately once every 10 years. Eliminating access on 6 miles of ways would cause a minor inconvenience to livestock operators as much of the current management is by horseback.

Conclusion: Designation would cause slight inconvenience to livestock operators from closure of 6 miles of ways.

Impacts on Wood Products

No salvage logging in 600 acres of ponderosa pine in Colvin Timers would be allowed.

Impacts on Recreation Use

The entire 23,760 acres would be closed to vehicle traffic, including 6 miles of ways. Primitive recreation values would be enhanced by the elimination of vehicles. Vehicle-oriented hunting would be displaced to areas outside the WSA and would be replaced by primitive types of hunting. Hang gliding would not be permitted, representing complete elimination of 30 visitor days in the WSA for this activity. Primitive recreation use in the WSA could increase as recognition of the primitive recreation potential of the area increases. An annual increase of 200 visitor days per year would be expected. The sightseeing value for 60,000 visitor days annually would be retained.

Conclusion: Primitive recreation would be enhanced esthetically and would increase under this alternative. There would be a slight decline in vehicle-oriented hunting in the WSA. The overall recreation use is expected to increase from 2,100 to 2,300 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 708 AUMs. Overall recreation use would increase by 200 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $2,400 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $2,400.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 23,760 acres

Impacts on Wilderness Values

Under this alternative, the entire 23,760 acres of the Abert Rim WSA would not receive legislative protection. Wilderness values of naturalness, opportunities for solitude or primitive and unconfined types of recreation, bighorn sheep and raptor nesting habitat, unique archeological and geological features, and outstanding scenic qualities would be subject to the effects of the projected management actions of reservoir construction, possible salvage logging, and to continued vehicle use.

Naturalness

Naturalness would be impacted by salvage logging of the Colvin Timbers in the event of disease or insect infestation. This activity would involve 3 miles of new road reconstruction. Logging operations, including road reconstruction, would directly affect 600 acres and indirectly affect an additional 600 acres.

Construction of a reservoir would be realized under this alternative. Reservoir construction with heavy equipment would directly affect 2 acres, including the .25 miles of access disturbance. Visual impact of this project would affect approximately 10 acres, including the impact of livestock concentration and removal of vegetation in the area surrounding the water source.

Slightly increased vehicle use on the 6 miles of ways would maintain the visual impact of the vehicle tracks upon naturalness on approximately 1,700 acres.

Solitude

Should the old-growth ponderosa pine in Colvin Timbers suffer from disease or insect infestation, salvage-mortality logging would affect opportunities for solitude in the southern portion of the WSA during logging activity. The visual impact would affect approximately 1,200 acres and the auditory impact would affect a much larger area in the short term.

Under the no wilderness alternative, opportunities for solitude within the WSA would continue to be impacted by vehicle traffic associated with livestock management activities and hunting on the 6 miles of ways. Minor expansion of the ways could be expected.

Opportunities for solitude would also be briefly impacted during construction of a reservoir. The increase in numbers of cattle and management activities in the vicinity of the new reservoir would introduce the sights and sounds of human activity to a new, but very localized, area.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would not be significantly affected under this alternative except in the event of salvage logging in Colvin Timbers. The impact of removal of the old-growth would alter a prime camping area. Vehicle use of 3 miles of way and another 3 miles of road would have limited short-term impact.

Special Features

The Colvin Timbers, the northernmost extension of ponderosa pine in the Warner Mountains, would be open to salvage logging. The resultant impacts from 3 miles of road reconstruction and timber removal in the event of salvage-mortality logging would disturb natural conditions on 1,200 acres.

Cultural resources would be subject to damage from continued vehicle use.

Conclusion: In the absence of wilderness designation, wilderness values would be impacted on approximately 1,700 acres by continued vehicle use of ways and project construction, with the possibility of an additional 1,200 acres of disturbance if salvage logging should occur. Further declines in wilderness values from other potential uses would be possible over the long term.

Impacts on Energy and Mineral Development

The entire 23,760 acres would be open to mineral entry.

Energy Development

Geologic evidence does not support an extensive exploration or development program in the area. Only casual exploration is expected.

Conclusion: There would be no impact on energy development.

Mineral Development

Geologic potential identified in U.S. Bureau of Mines reports does not indicate potential for development. Only casual exploration is anticipated.

Conclusion: There would be no impact to mineral development.

Impacts on Vegetation

Vegetative composition or ecological status on most of the WSA would be minimally affected. Reservoir construction would disturb 2 acres of existing vegetation directly by displacement of soils. Approximately 5 acres would be affected by concentration of livestock around the reservoir by grazing and trampling. Another 600 acres could be affected by logging activities in the event of disease or insect infestation of Colvin Timbers. An unquanitified number of trees would be cut, and shrubs and grasses would be disturbed by the use of heavy equipment for the harvest of logs.

The 6 miles of ways would not revegetate due to continued vehicle use.

Conclusion: Vegetation would be disturbed on 7 acres and on an additional 600 acres if logging activity occurs.

Impacts on Wildlife

Salvage logging operations on 600 acres, should they occur, would impact cavity-nesting species, raptors, mule deer and small mammals by removal of ponderosa and standing snags. Mule deer and small mammals would be disturbed or eliminated in the short term by the removal of tree cover and the associated disturbance of shrubs and grasses. Forage for deer and cover for small mammals would increase in the long term.

Bighorn sheep and antelope populations would continue to be disturbed by vehicle use on the existing 6 miles of ways within the WSA, especially during deer, antelope and upland game bird hunting seasons. Improvement of road access to the Colvin Timbers to provide for any possible salvage timber sale would greatly ease access and lead to considerable impact from increased visitor use and ease of hunter access.

Construction of one reservoir would improve water availability for wildlife.

Conclusion: Short-term loss of habitat would occur for deer and small mammals if logging occurs in Colvin Timbers. Habitat for deer would increase in the long term, while cavity nesting habitat would suffer long-term loss. Construction of a reservoir would improve water availability.

Impacts on Watershed

Little impact on water quality is expected as the perennial springs are located high on the rim and are relatively inaccessible. Increased turbidity and sedimentation from logging operations would result along the Honey Creek drainage outside of the WSA.

Conclusion: Short-term increase in sedimentation and turbidity could result in the event of logging in Colvin Timbers.

Impacts on Livestock Grazing

The current grazing use of 708 AUMs within the WSA would be maintained. Construction of a reservoir south of Mule Lake would improve livestock distribution and achieve better utilization of forage. The 6 miles of ways would remain open to vehicle use for livestock operations.

Conclusion: Livestock distribution would be more uniform within the grazing allotment with the construction of a reservoir.

Impacts on Wood Products Harvest

Salvage sale of ponderosa in the Colvin Timbers would be allowed if insect infestation or disease warrants. Up to a maximum of 3 million board feet (3 MMbf) is available (clear cut), but no specific volumes of timber would be projected with any certainty at present. Amounts would be minor and considerably less than 3 million board feet. Such a sale would be dependent upon combining a BLM sale with a local sale on Forest Service land to make the operation cost-effective.

Conclusion: Minor potential for timber salvage sale would exist.

Impacts on Recreation Use

Primitive recreation qualities would be impacted by vehicle-oriented recreation and logging in Colvin Timbers. Increased vehicle access in the event of 3 miles of road reconstruction for salvage logging would impact primitive recreation opportunities while increasing vehicle-oriented recreation opportunities. Roads outside the WSA would also have to be reconstructed from the Fremont National Forest to complete a sale in the Colvin Timbers. This would upgrade the access to recreation users and likely result in a large increase in recreation use of the area. As much as 1,000 visitor days per year increase would be probable. Hang gliding from the rim would continue. Overall active recreation use is expected to remain within the 1,600 to 2,100 visitor-days-per-year range (if no upgrade of the road results from sale of timber in the Colvin Timbers). Passive recreation use represented by vehicle stops at the Abert Rim interpretive sign/geologic marker on Highway 395 is expected to remain at approximately 60,000 visits per year.

Conclusion: Recreation use of the WSA is not expected to change from the current 2,100 active visitor days per year unless road access is improved. If vehicle access is improved, an increase of 1,000 visitor days is projected to a total of 3,100 visitor days annually.

Impacts on Local Personal Income

Livestock grazing would remain at 708 AUMs. The Colvin Timbers would remain outside the timber cutting base, however, it would be subject to potential salvage harvest. No viable prediction on harvest levels are available to project economic impact of this limited sale that would have to be tied to sales on adjoining U.S. Forest Service lands to make such a sale economically feasible. Overall recreation use would remain at 2,100 visitor days, unless road access is improved, which would increase use by 1,000 visitor days annually.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of up to $12,000 per year, plus an unknown level of increase attributable to timber products harvest in the event of a salvage sale in the Colvin Timbers.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain unchanged or increase by as much as $12,000.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action, the all wilderness alternative, vehicle use would be excluded, reducing opportunities for nonprimitive recreation and causing minor inconvenience to livestock operators. A reservoir to improve water distribution for livestock would not be built near Mule Lake.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, most short-term uses would continue, with some minor inconvenience to livestock operators resulting from the exclusion of vehicles within the WSA for salting livestock. A minor loss of short-term value would occur in the event of disease or insect infestation causing a loss of timber in the Colvin Timbers as salvage would be precluded. The long-term productivity of the wilderness and natural resource values would be preserved under this alternative.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area is manageable as wilderness. For the most part, the boundaries of the WSA are well defined and easily enforceable as wilderness, although recognition of the boundary on the southeast would require signing at regular intervals.

Rationale for Selection of the Proposed Action

Abert Rim represents an outstanding scenic attraction in eastern Oregon with prime recreation opportunity. The WSA supports California bighorn sheep, a candidate Threatened and Endangered wildlife species highly identified with and dependent on a wilderness type of management for protection of its habitat. The dramatic topographic relief, vegetative and wildlife diversity, outstanding recreational opportunities, cultural resource values, as well as the naturalness and scenic qualities of the area contribute to its many wilderness values. The benefits of preserving those values outweigh the benefits of development of a livestock reservoir, salvage logging, and continued vehicle access to a limited portion of the WSA.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and as oral testimony at public hearings during the comment periods of the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: Another alternative closing the jeep trail between inventory units 101 and 102 and combining the two units, and the Sierra Club's 41,200-acre alternative should be considered. **Response:** These alternatives are beyond the scope of this EIS, which analyzes the wilderness and non-wilderness recommendations for areas meeting the wilderness inventory criteria. Unit 102 was determined by BLM to not qualify for further wilderness study. See Chapter 5 of the Statewide Volume under Formulation of Alternatives for a more thorough discussion of rationale for not analyzing this and similar alternatives.

Comment: Binkie Lake and Coyote Hills should be included by closing roads 6135 and 6145. **Response:** same as above.

Table 1. Summary of Proposed Management Under Each Alternative, Abert Rim WSA (OR-1-101)

Proposed Management	All Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	23,760	0
Acres Closed to ORVs by Wilderness Designation[1]	23,760	0
Miles of Ways Closed	6	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	23,280	0
Structural Livestock Projects Developed: Reservoirs (number)	0	1
Acres of Salvage Logging	0	600
Miles of Road Reconstruction	0	3

Table 2. Summary of Environmental Consequences of Alternatives, Abert Rim WSA (OR-1-101)

Resource or Activity	All Wilderness (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 23,760 acres would result in protection and enhancement of existing wilderness values.	Projected management actions would impair the area's wilderness values over approximately 1,700 to 2,900 acres.
Energy and Mineral Development	No impact to energy or mineral development is expected.	There would be no impact to energy or mineral development.
Vegetation	The 6 miles of ways would revegetate.	Vegetation would be altered on 7 acres by reservoir construction and an increase in concentration of livestock. Another 600 acres could be affected by salvage logging.
Wildlife	Habitat and populations would be maintained throughout the area. Habitat enhancement of bighorn sheep and pronghorn habitat.	Wildlife would be subject to minor and temporary levels of disturbance due to vehicle use. Habitat for mule deer, raptors and cavity-nesting species would be reduced by salvage logging on 600 acres. Water availability improved by construction of one reservoir.
Watershed	No impact to water quality.	Water quality in Honey Creek drainage would be temporarily degraded by salvage logging activities.
Livestock Grazing	Continued improper livestock distribution due to loss of opportunity to construct one reservoir. Reduced vehicle use would cause a minor inconvenience to livestock operators.	Construction of one reservoir would improve livestock distribution.
Wood Products	No salvage logging would be allowed.	Salvage logging could take place.
Recreation Use	An increase in recreation by 200 visitor days per year is expected.	No change in the level or type of use is expected, except for a 1,000 visitor day increase if vehicle access is improved by road improvements for logging operations.
Local Personal Income	Annual local personal income would increase by more than $2,000.	Annual local personal income could increase by approximately $12,000.

Table 3. Classification of Energy and Mineral Potential, Abert Rim WSA (OR-1-101)

Commodity	Area	Level of Potential	Level of Certainty
Metals	Entire WSA	L	B
Geothermal	See Map 3	M	B
	Rest of WSA	L	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	0	C
Bentonite	Entire WSA	L	B
Diatomite	See Map 3	L	B
	Rest of WSA	0	B
Zeolites	Entire WSA	0	C

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

Table 4. Existing Livestock Use, Abert Rim WSA (OR-1-101)

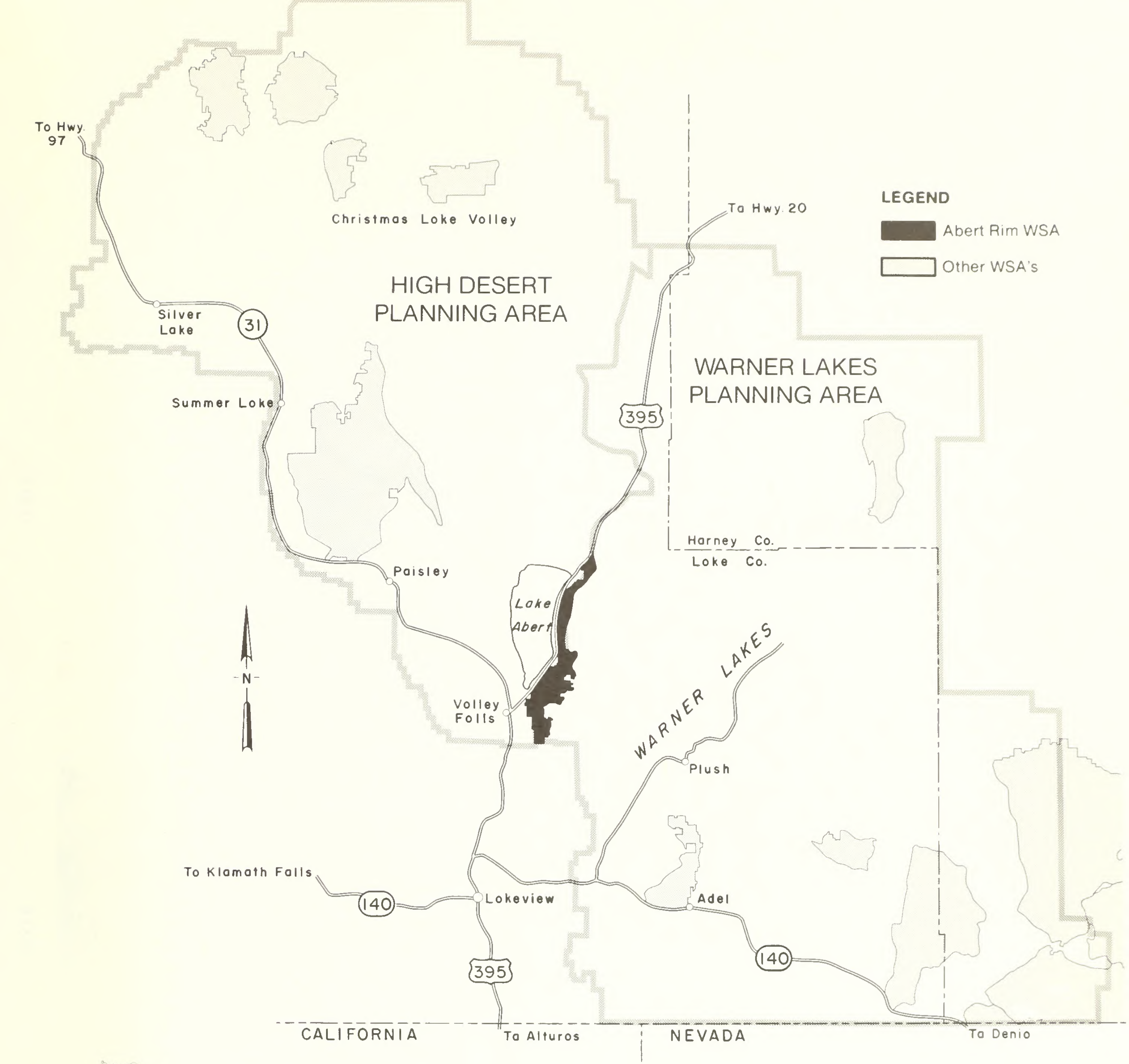
Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Abert Seeding (No. 0522)	2,619	06/16-01/20	5.0	131
FRF Fitzgerald (No. 0502)	346	03/01-02/28	2.5	9
Clover Creek (No. 0518)	435	06/01-11/01	22.9	100
Coyote-Colvin (No. 0517)	5,091	03/16-12/15	9.2	468
Paisley Common-Abert Rim[1] (No. 0400)	19,124	None		0
Total	27,615			708

[1] Based on only the area in the Abert Rim pasture. Paisley Common pasture in the WSA has no allocated livestock grazing. The only livestock use in this pasture, which consists of most of the scarp area, is by moving livestock from one area to another.

Table 5. Effects of Alternatives on Local Personal Income, Abert Rim WSA (OR-01-101) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Livestock Grazing	AUMs	No Change	No Change
Timber Production[1]	Mbf	No Change	Unknown
Recreation Use	RVD	+ 200	0 to 1,000
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES			
Livestock Grazing	$	No Change	No Change
Timber Production[1]	$	No Change	Unknown
Recreation Use	$	+ 2,400	0 to +12,000
Total	$	+ 2,400	0 to +12,000

[1] Income from timber production would only occur as a result of a salvage sale.



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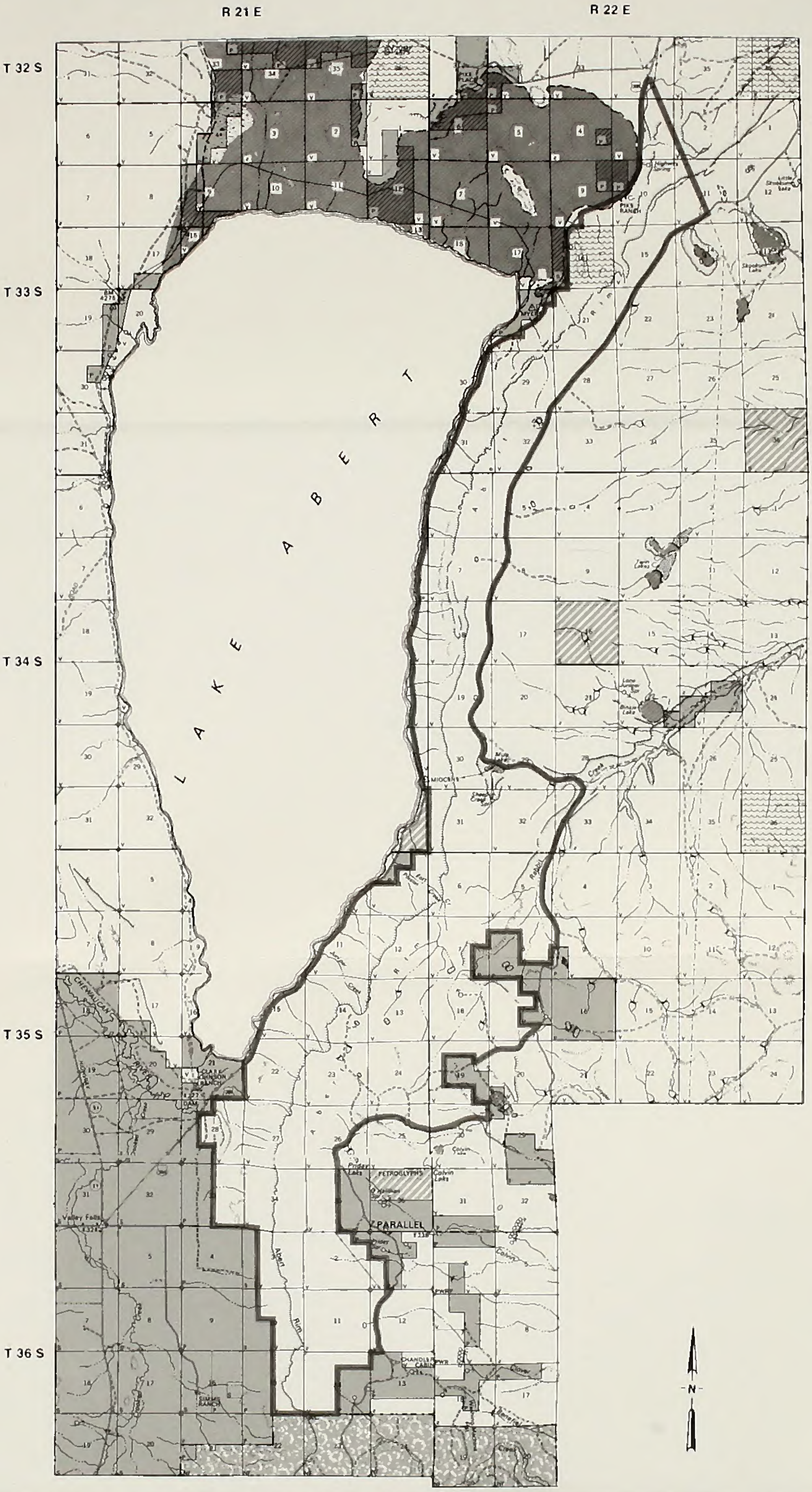
Bureau of Land Management
Lakeview District

Abert Rim WSA
OR-1-101

LOCATION MAP

MAP 1



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Bureau of Land Management
Lakeview District

Abert Rim WSA
OR-1-101

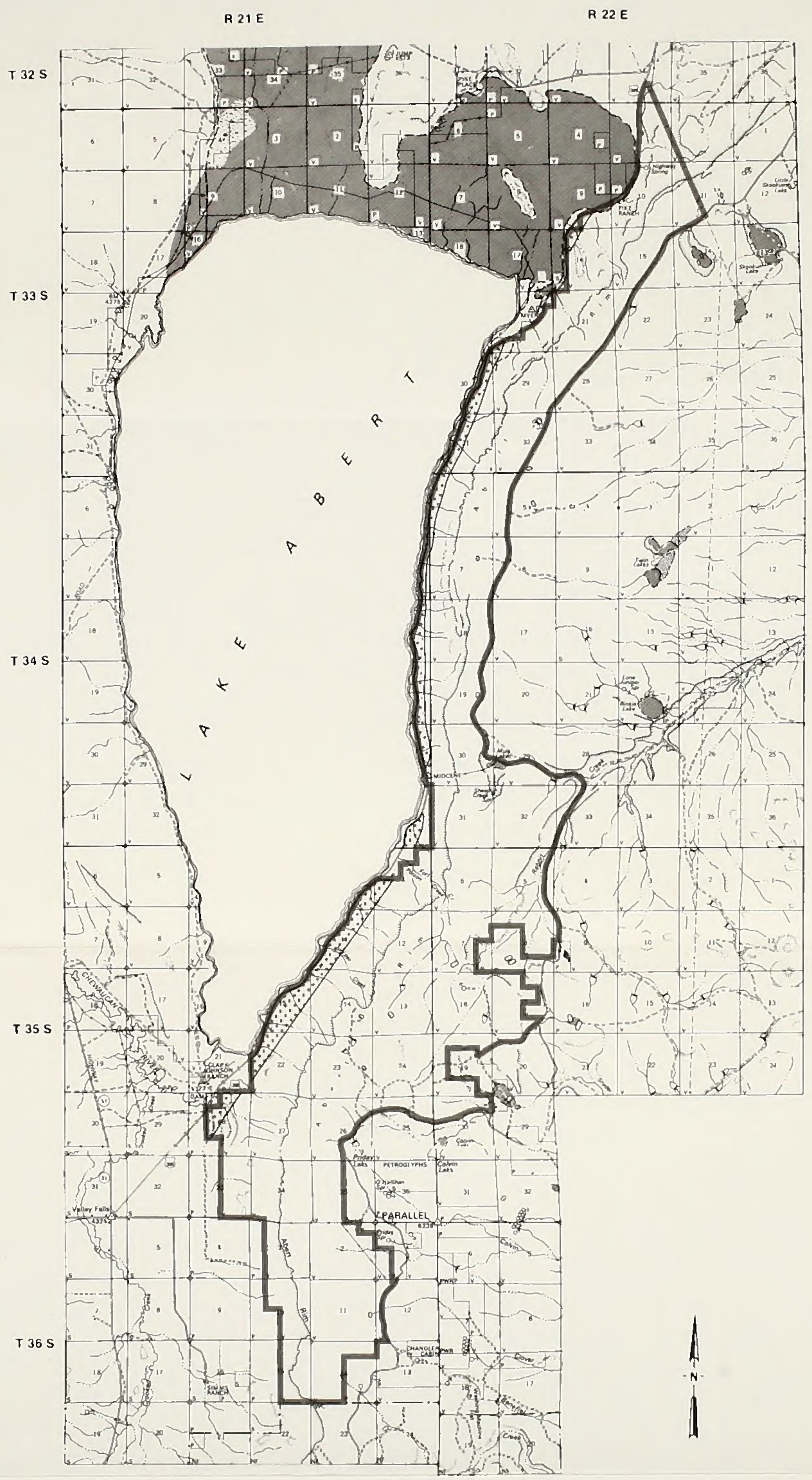
LAND OWNERSHIP

1 0 1 2 MILES

LEGEND

- ▭ BLM Land in WSA Studied Under Section 603 of FLPMA
- — Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ▩ U.S. Forest Service
- ▤ BLM Surface-State or Private Subsurface (Split Estate)

MAP 2



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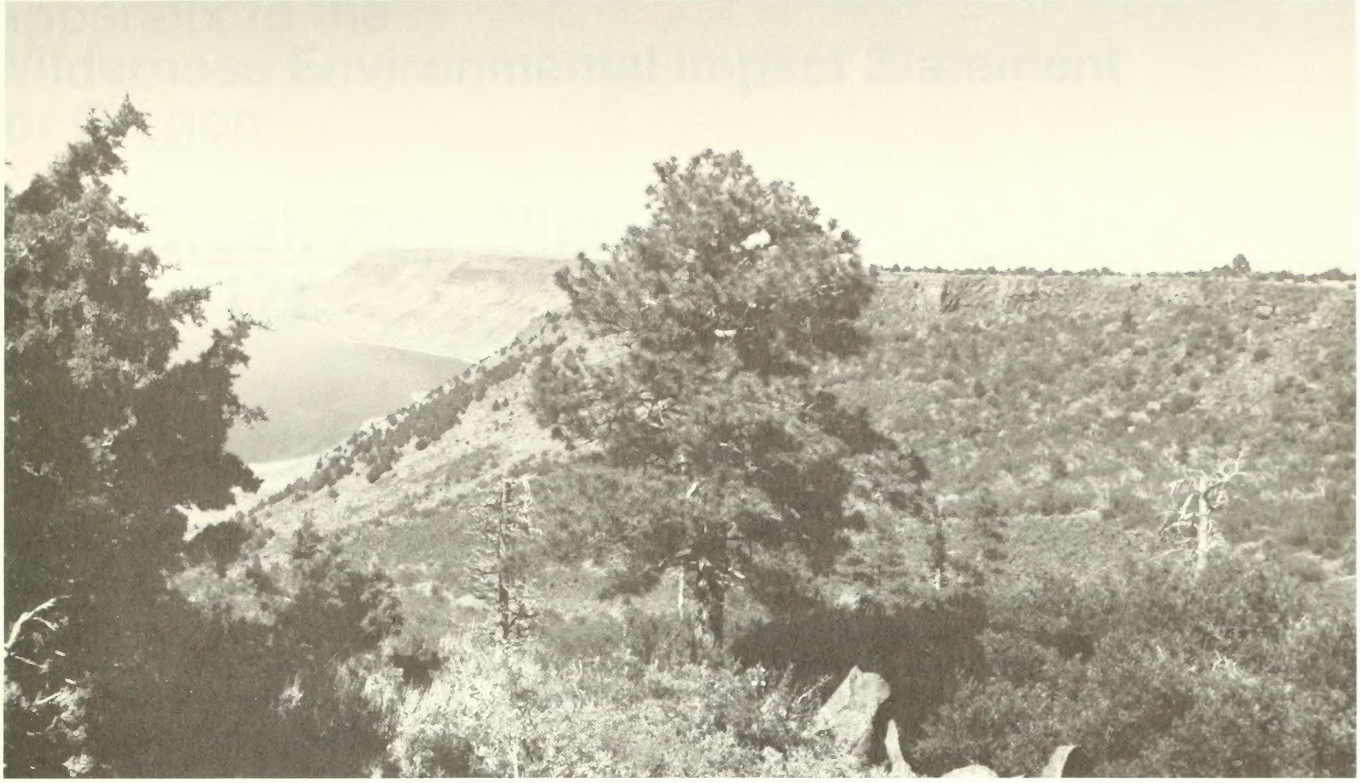
Abert Rim WSA
OR-1-101

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

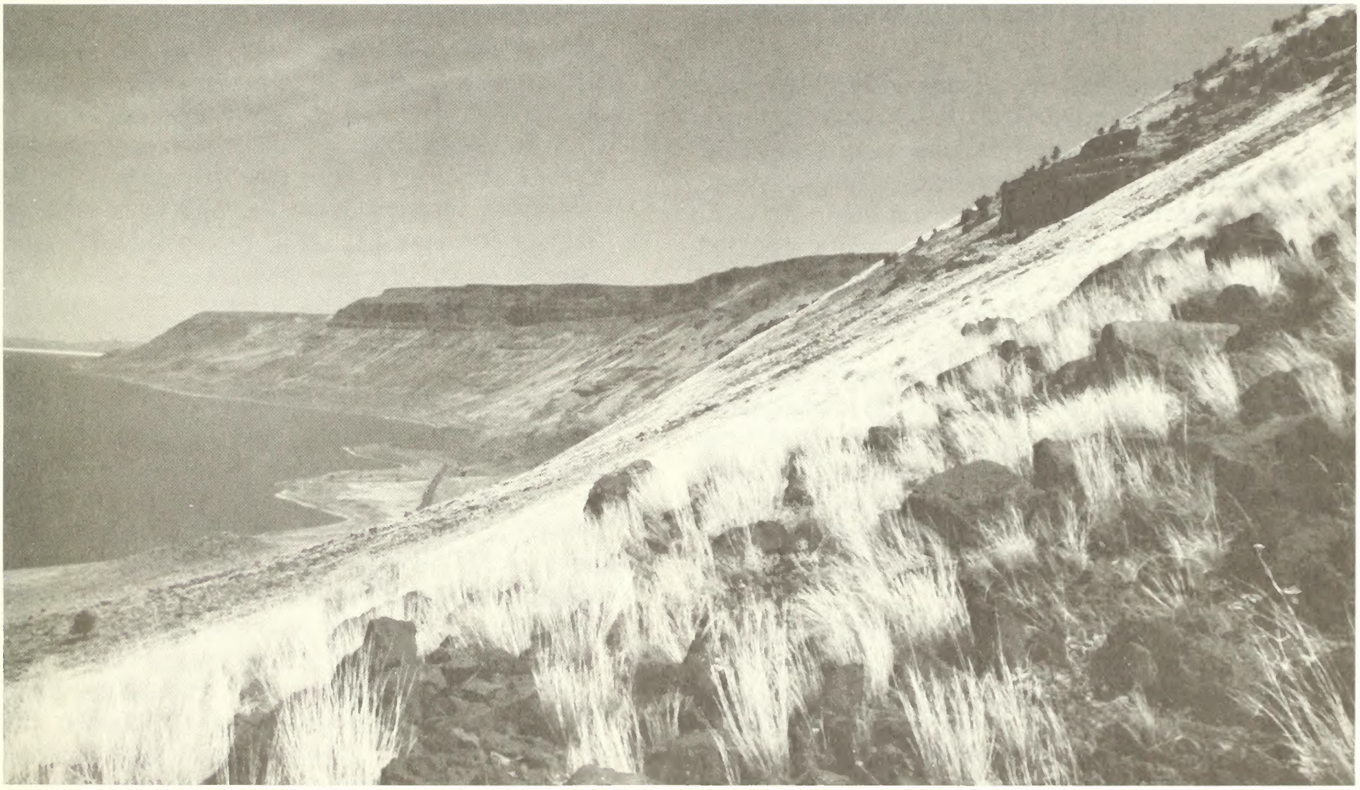
1 0 1 2 MILES

▨ **Moderate Potential (MB) for Geothermal Resources**

MAP 3



Abert Rim WSA, OR-1-101. Abert Rim and Abert Lake from the rim near Juniper Creek. Within the area recommended suitable under the proposed action (all wilderness). illustrates vegetation cover and typical view from the south part of the rim. July 1980.



Abert Rim WSA, OR-1-101. Looking north about half-way up Abert Rim near Poison Creek. Within area recommended suitable under the proposed action (all wilderness). Terrain typical of the south end of Abert Rim. September 1982.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Fish Creek Rim Wilderness Study Area (OR-1-117)

1. Introduction

General Description of Study Area

Fish Creek Rim Wilderness Study Area (WSA) is located immediately north of the town of Adel, Oregon, on State Highway 140, 30 miles east of Lakeview, Oregon in Lake County (see Map 1). Roughly crescent-shaped, the WSA extends approximately 10 miles north of Adel along the Fish Creek Rim, and varies in width from 0.5 to 5.5 miles.

The WSA contains 16,690 acres, all of it public land, including 620 acres of split-estate land (see Map 2). Boundaries are defined by State and private lands on the north and east, mostly by a low standard dirt road on the west and by powerline rights-of-way adjacent to Oregon State Highway 140 on the south. East of the WSA, most land ownership is private; lands west of the WSA are mostly BLM. The east side roughly parallels the paved county road which runs between Adel and Plush. Primary resource use of the area is for livestock grazing, wildlife habitat and recreation.

The primary feature of the WSA is the east-facing scarp of Fish Creek Rim, which rises 1,500 to 2,000 feet above the Warner Valley to the east. The area west of the rim is known as Monument Flat. This area is primarily a low sagebrush and juniper flat sloping westward from the rim. The part of the WSA just west of the rim, in the central and north portions, contains minor broken rims trending northwest to southeast. South of this broken terrain, the WSA is open, low sagebrush country. The southwest corner of the WSA contains Sweeney Canyon which drains southward into Deep Creek Canyon.

Vegetation includes dense stands of mountain mahogany, small aspen groves, scattered junipers west of the rim, and considerable juniper cover on the east face. There are a few white fir growing on and just below the rim. The gently-sloping southwestern portion of the WSA is primarily low sagebrush/grassland dotted with western juniper.

There is a microwave relay tower on the rim at the end of a 3-mile dead-end road extending into the southeast corner of the WSA from Highway 140. The microwave site and road form part of the WSA boundary. An old access road to the microwave site from near Monument Flat has been closed by BLM due to lack of need for the access and to lack of funds to maintain it.

Interrelationships

The WSA is within the Oregon Department of Fish and Wildlife's (ODFW) 960-square-mile Warner Wildlife Management Unit. Approximately 17 percent of the crucial winter range for the Deep Creek mule deer herd is within the WSA. Currently, about 500 deer winter in the study area. ODFW management goals are to maintain a summer population of 8,000 adult mule deer for the management unit as a whole. Between 150 and 175 antelope also use the WSA between March and December each year. No management goals for antelope have been set. Sage grouse inhabit the study area in undetermined numbers. No management goals have been set for this upland game bird. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

In January 1988, eight ewes, three ewe lambs, and a 2-year old ram were released in the area by ODFW in an attempt to establish a self-sustaining population as a part of the Department's long-term efforts to re-establish California bighorn sheep to their historical range. The proposed action for this WSA conforms with this goal.

The reintroduction of peregrine falcons to Fish Creek Rim is proposed by BLM and U.S. Fish and Wildlife Service (USFWS). This project has been delayed pending the outcome of peregrine introductions to be done on the Winter Rim area of the Fremont National Forest. The proposed action conforms with the goal to establish a self-sustaining population of peregrine falcons on Fish Creek Rim.

Approximately 1,000 acres of a proposed 1,280-acre Research Natural Area lie within the WSA. This proposed RNA encompasses five cells (a cell represents a terrestrial or aquatic habitat or plant community that would serve as baseline data collection areas for comparison with areas more influenced by introduced human uses, and for ecological and environmental research and education): big sage-bitterbrush/Idaho fescue, low sage/Idaho fescue, low sage/Sandberg's bluegrass, mountain mahogany and birds of prey rimrock nesting area. The proposed action for this WSA would not affect the designation or non-designation of this RNA, but could enhance its management, since a goal of both wilderness and RNA management is to preserve existing natural conditions.

An 85,663-acre Known Geothermal Resource Area (KGRA) is adjacent to the WSA on the east, with approximately 4,480 acres lying within the WSA.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for analysis in the Fish Creek Rim WSA include:

- impact on wilderness values
- impact on natural vegetative communities,
- impact on livestock grazing use levels and management,
- impact on mineral and geothermal development,
- impact on California bighorn sheep and mule deer habitat and populations,
- impact on reintroduction of peregrine falcon,
- impact on hunting and other vehicle-related recreation,
- impact on proposed utility corridor, and
- impact on wood product harvest.

The following topics were also considered, but were not analyzed for this WSA because their environmental significance or concern was not major to the decision process:

- impact on the operation of the microwave tower on the south end of the WSA (no impacts under any of the alternatives), and

- impacts to private lands adjacent to the WSA (discussed in the statewide EIS volume).

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project location, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (proposed action)
- no wilderness/no action

All Wilderness

The all wilderness alternative would recommend 16,690 acres of public land in the WSA suitable as wilderness (see Map 2). For purposes of analysis this

alternative assumes that the 3-mile service road to the microwave tower from Highway 140 would remain open, and the microwave station itself (approximately .25 acre) would be excluded from the WSA.
It is also assumed that neither the 620 acres of mineral estate of the split-estate land nor the approximately 400 acres of private land adjacent to the WSA boundaries would be acquired.

Energy and Mineral Development Actions

Wilderness designation would withdraw 16,070 acres in the WSA from all appropriations under mining and mineral leasing laws.

Energy development to include the development of 5 to 15 geothermal wells affecting 120 acres in the WSA would be foregone on the 4,480 acres with high geothermal potential within the WSA. Limited geologic data indicate that potential for energy resources is low on the 620 acres of split-estate land.

No moderate or high mineral potential is identified in the WSA, therefore no development is projected. Casual exploration would continue to occur.

The split-estate parcel, 620 acres, would be open to mineral entry. As the potential for energy or mineral occurrence is low, only casual exploration for minerals would be projected as foregone.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM Wilderness Management Policy. Forage availability for wildlife is coordinated in conjunction with the livestock allotment management plan. Habitat for 150 to 175 antelope and one kidding ground, and for an undetermined number of sage grouse would be maintained. Management emphasis would be placed on preserving crucial deer winter range for about 500 mule deer, the reintroduction of California bighorn sheep and the reintroduction of peregrine falcons. Peregrine reintroduction would require temporary support actions which would comply with the Wilderness Management Policy to reintroduce this native, extirpated species. No wildlife development projects are planned.

Livestock Management Actions

Livestock use would remain at the current level of 778 AUMs within the WSA, which includes all or portions of five grazing allotments. The season of use for the allotments would be as identified in Table 4. Vehicle use for livestock management would be excluded on ways in the WSA. Ways from Rogers Ranch to Sweeney Reservoir and along existing fences, as well as the dead-end road to the microwave tower, would be used for livestock management. Reservoir and waterhole maintenance at 22 locations would require heavy equipment every 5 to 10 years. Two reservoirs are near the WSA's west boundary road, and four reservoirs are along existing ways. Two reservoirs and existing waterholes not along way or roads would require that the equipment be driven cross-country.

All remaining livestock management activities within the WSA, including fence maintenance, would be accomplished by horseback. No livestock developments would be implemented.

Wood Products Management Actions

Harvest of juniper for fenceposts or firewood on 2,160 acres would be precluded. Demand could be met from lands outside the WSA.

Recreation Management Actions

The entire 16,690-acre WSA, including 6 miles of ways, would be closed to vehicle use for recreation activities. The 3-mile dead-end road to the microwave tower from Highway 140 would remain open. Current recreational use of the WSA is estimated to be approximately 500 visitor days per year, primarily associated with hunting and sightseeing. There are no projected management actions.

Enhanced Wilderness

The enhanced wilderness alternative would recommend 15,740 acres suitable as wilderness. This acreage total assumes acquisition of the mineral estate on 620 acres of split-estate land and acquisition of 400 acres of private land. Boundaries of the suitable area are as described for the all wilderness alternative, except that the southern boundary would be defined by the low standard dirt road from Rogers Ranch on Highway 140 to the microwave tower, and by a powerline right-of-way extending from the microwave site southeastward to private land adjacent to Highway 140 (see Map 3).

Approximately 1,350 acres at the southern end of the WSA would be recommended nonsuitable.

Energy and Mineral Development Actions

Wilderness designation would close 15,740 acres (including 400 acres of acquired private inholdings and 620 acres of acquired mineral estate) to mineral entry. Development of from 5 to 15 geothermal wells affecting 120 acres within the WSA would be foregone. As there is no moderate or high mineral potential in the area, only casual exploration for minerals would be foregone.

The 1,350 acres recommended nonsuitable would be open to mineral entry, including 260 acres with high potential for geothermal resources. Since the Known Geothermal Resource Area associated with Fish Creek Rim encompasses 81,183 acres outside of the WSA, exploration and development on these steep 260 acres is highly unlikely. Only casual exploration for minerals would be foregone as no moderate or high potential exists to support mineral development.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW goals and BLM's Wilderness Management Policy. Habitat management would emphasize maintaining crucial deer winter range for about 500 deer, supporting California bighorn sheep reintroduction and reintroducing peregrine falcons. Habitat for 150 to 175 antelope, and for sage grouse would be maintained. No wildlife developments are proposed under this alternative.

Livestock Management Actions

Livestock grazing use would remain at the current level of 778 AUMs. Livestock management activities would be accomplished using horses. Waterhole and reservoir maintenance would be achieved as described for the all wilderness alternative for the 22 reservoirs and waterholes. None of these watering facilities are located in the nonsuitable portion. No projects would be completed under this alternative.

Wood Products Management Actions

Harvesting of juniper would be precluded on 1,720 acres with juniper cover. Approximately 440 acres of juniper lands would be open to harvest.

Recreation Management Actions

The 15,740 acres recommended suitable would be closed to motorized vehicle use. This closure would affect 6 miles of ways. Current recreational use is estimated to be about 500 visitor days per year.

The 1,350 acres recommended nonsuitable would be open to vehicles. There are no ways located in this portion of the WSA, nor is much of the terrain suited to off-road vehicle use.

Partial (Proposed Action)

The partial alternative would recommend 11,920 acres of public land suitable as wilderness. This figure assumes acquisition of the mineral estate on 620 acres of split-estate land from willing owners through purchase or exchange. The boundary on the east would follow private land. The boundary at the northern end would be defined by a way; the boundary on the southern end would be defined by a way and a powerline right-of-way. The western boundary would follow a low standard dirt road (see Map 4).

Areas recommended nonsuitable are approximately 1,850 acres at the northern end of the WSA, 2,720 acres at the southern end of the WSA, and 200 acres in two small parcels on the southeastern boundary, for a total of approximately 4,770 acres.

Energy and Mineral Development Actions

Wilderness designation would close 11,920 acres to mineral entry, including 620 acres of acquired mineral estate. The opportunity to develop from 5 to 15 geothermal wells affecting 120 acres would be foregone. The 4,770 acres recommended nonsuitable for wilderness would be open to mineral entry.

A total of 500 acres in the southeastern portion of the WSA with high potential for geothermal resources would be open to exploration and development. Only casual geothermal exploration is projected as it is unlikely that development would occur on these steep-terrain lands with 85,163 acres of more developable terrain in the Known Geothermal Resource Area outside of the WSA.

No mineral development is projected in the WSA as no moderate or high mineral potentials are identified. Casual exploration would occur on nonsuitable lands.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to support existing wildlife populations in accordance with ODFW goals and the BLM's Wilderness Management Policy on the lands designated wilderness. Management emphasis would remain on maintaining crucial deer winter range for about 500 mule deer, maintaining California bighorn sheep habitat, and on the reintroduction of peregrine falcons. Habitat and one kidding ground for 150 to 175 antelope and habitat for sage grouse would be maintained.

Habitat on lands recommended nonsuitable would be managed to support ODFW goals. A proposed 200-acre burn-and-seed project to benefit antelope in the portion recommended nonsuitable would be accomplished, and a small wildlife guzzler would be installed south of the proposed seeding.

Livestock Management Actions

Livestock use would remain at current levels of approximately 560 AUMs in the portion recommended suitable. Livestock management activities would be accomplished using horses. Heavy equipment would be used once every 5 to 10 years for maintenance of 12 waterholes and reservoirs. All other livestock management activities, including fence maintenance, would be accomplished by horseback.

In the nonsuitable portion, 400 acres of burn-and-seed would be realized, increasing livestock allocation by approximately 83 AUMs above the present allocation of 218 AUMs, for a total of 861 AUMs in the WSA. Three miles of ways would remain open to vehicles for routine livestock management and for maintenance of 10 reservoirs and waterholes.

Wood Products Harvest Management Actions

Cutting of trees for fenceposts and firewood would be precluded on the 600 acres of harvestable juniper located within the suitable portion due to the impact on wilderness values.

Harvest of juniper in the northern and southern nonsuitable portions would be allowed on 1,560 acres.

Recreation Management Actions

The 11,920 acres, including 3 miles of ways, recommended suitable under this alternative would be closed to motorized vehicles. Another 3 miles of ways in the nonsuitable portion would remain open to vehicles. The WSA currently receives approximately 500 visitor days of recreation use annually.

No Wilderness/No Action

This alternative would recommend none of the WSA suitable as wilderness. It represents continuation of the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire 16,690-acre Fish Creek Rim WSA would be open to mineral entry.

A high potential for geothermal resources is assigned to 4,480 acres in the eastern part of the WSA within the Crump KGRA. Initial exploration would involve resistivity, gravity, and/or magnetic surveys and geologic mapping requiring cross-country travel. Surface disturbance from the surveys and mapping would be minimal. Further exploration would involve drilling 10 geothermal gradient wells. Each well site would require a pad that is 100 feet by 100 feet, or 0.2 acres. Total direct disturbance would be 2 acres, approximately 120 acres would be visually affected. Truck-mounted rotary rigs would be used which could travel across the relatively flat basin without roads or by using pre-existing roads with minimum road grading.

The greatest geothermal resource potential appears to be located in the vicinity of Crump Geyser in the east-central part of the WSA. Development is postulated to include 5 to 15 production wells within the WSA area, with pipelines supplying a power plant located east of the WSA. Total surface disturbance for exploration and development is estimated to be approximately 25 acres. Most of the actual power plant facility would probably be on private land, the public land within the WSA being too steep to make construction feasible.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations. Forage availability for wildlife is coordinated in conjunction with the livestock grazing allotment management plan. Habitat and one kidding ground for 150 to 175 antelope and habitat for sage grouse would be maintained. Emphasis would be added in this area on supporting the California bighorn sheep herd, crucial deer winter range for about 500 mule deer and reintroduction of peregrine falcon. A proposed 200-acre burn-and-seed to improve antelope forage and a proposed guzzler would be allowed.

Livestock Management Actions

Burn-and-seed projects to increase livestock forage by 164 AUMS on approximately 800 acres would be allowed, resulting in a total of 942 AUMs within the WSA. A small reservoir and 1 mile of fence designed to improve the distribution of livestock would also be constructed. These two projects would impact 2 acres directly and 40 acres visually. The 6 miles of ways within the WSA would remain open to unrestricted vehicle access for livestock management activities, including maintenance of 22 waterholes and reservoirs and on 4 miles of fence.

Wood Products Management Actions

Harvest of juniper for fenceposts and firewood on 2,160 acres within the study area would be allowed. No road construction would be required, travel would be cross-country and have short-term impact on the total acreage where harvest occurs.

Recreation Management Actions

The entire WSA and its 6 miles of ways would remain open to vehicle traffic. The rough, steep terrain which characterizes the majority of the WSA restricts off-road usage. Current recreation activity in the WSA is estimated to be approximately 500 visitor days per year.

Summary

Table 1 summarizes the projected management actions under each
alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Most of the WSA is natural in appearance. Topography and vegetation have either prevented development in the area or mask the limited development that has occurred. The dense groves of mountain mahogany and stands of juniper contribute significantly to the natural appearance.

The WSA contains 22 small water developments. Their small size and distribution render them unnoticeable in the area as a whole. Many of these waterholes and reservoirs are difficult to locate on the ground. The WSA contains 4 miles of fence: 3 miles near Sweeney Canyon, which are screened by sagebrush, and 1 mile which runs through a dense mahogany thicket in the central part of the WSA . The 6 miles of ways in the area directly affect 6 acres and indirectly affect 60 acres.

The route to the microwave site which was closed by BLM due to lack of need and lack of funds has revegetated to the extent that it is not noticeable from a distance. Rock piles remaining from the road construction still exist along portions of the route.

Approximately 1 mile of powerline which supplies the microwave site enters the WSA from adjacent private land at Crump Ranch. It visually affects approximately 100 acres within the WSA. A small television antenna east of Cleland Springs serving the town of Plush is visible from less than 40 acres due to its location in dense mountain mahogany. These unnatural features directly affect 40 acres and visually influence an additional 140 acres in the WSA.

A 750-kV powerline outside the WSA has a minor visual impact on visitors inside the WSA on approximately 600 acres. The microwave tower outside the WSA is visible from the low sagebrush flat on the south end of the WSA. The size of the tower in proportion to its surroundings makes it inconspicuous at any distance over 0.5 mile. The outside sights of the powerline and microwave tower visually influence less than 1,000 acres as a foreground visual influence.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude are outstanding within the WSA, particularly in the wooded areas containing mountain mahogany or juniper on and below the rim. The low sagebrush flat area adjacent to the boundary road in the southern part of the area contains less vegetative or topographic screening, but offers ample opportunities for solitude. Even on the flats, the size of the WSA offers effective screening for solitude.

Outside sights and sounds affecting the solitude include a relatively high traffic volume on Highway 140 outside the WSA affecting the rim facing Deep Creek on the south due to considerable traffic noise. Public comments during the study suggested the Plush/Adel Highway has a similar impact on the study area; however, field review found that the traffic volume is much less (about 13 percent of Highway 140 traffic) and rarely noticeable within the WSA.

Primitive recreation opportunities are outstanding in the WSA. Hiking terrain varies from very easy to extremely rugged, with the most challenging opportunities on the east-facing scarp. Many good camping areas are located above the rim in mountain mahogany and aspen groves. The area offers excellent deer and antelope hunting opportunities. Opportunities for the observation and photography of mammals, birds, plants, geologic features and rock art are outstanding.

The scenery in the WSA is outstanding and the area offers magnificent views of the Warner Valley, Hart Mountain and the plateaus and desert to the east, as well as of Drakes Peak and the Fremont National Forest to the west.

Special Features

Fish Creek Rim is one of a series of steep fault block scarps which form the basin and range topography of much of southeastern Oregon. It is a major scenic landmark.

Approximately 1,000 acres of a proposed 1,280-acre Research Natural Area (RNA) which would fill five high-priority cells in the Oregon Natural Heritage Plan lies almost entirely within the WSA. The five cells are birds of prey rimrock nesting area, mountain mahogany, low sage/Sandberg's bluegrass, low sage/Idaho fescue and big sage-bitterbrush/Idaho fescue. The mountain mahogany are some of the largest and best quality stands within the Basin and Range Province in Oregon. The raptor nesting area is high-density and is included as potential nesting habitat for the peregrine falcon. The size of the RNA has been reduced from an original 3,000-acres proposal to 1,280 acres. All five cells are included in the 1,280 acres.

The Fish Creek Rim WSA contains a plant species of special interest, Melica stricta (strict onion grass or nodding melic), listed by the Oregon Natural Heritage Plan as threatened in Oregon but more common or stable elsewhere. It is considered rare in the Lakeview District. A small group of white fir on and below the rim is unique in that the main fir population in the Warner Mountains ends approximately 13 miles west of this location.

A band of California bighorn sheep (candidate Federal Threatened or Endangered species) now numbering approximately 20 animals inhabits 8,300 of the WSA year-round. Fish Creek Rim is also a high-density nesting area for many species of raptors and is an identified reintroduction site for peregrine falcon, a Federally-listed Endangered species. Sage grouse is another Federal candidate species for Threatened and Endangered status which inhabits 12,100 acres of the WSA.

Most of the WSA is within the Deep Creek deer herd crucial winter range. Approximately 500 deer winter in the WSA, which contains 17 percent of the herd winter range. Between 150 and 175 antelope use the WSA, and one kidding ground is located in the study area.

The WSA contains numerous cultural resources, including rock art sites, primitive hunting blinds and at least one prehistoric bighorn sheep hunting complex.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Fish Creek Rim WSA is located in the Intermountain Sagebrush Province with a potential natural vegetation of sagebrush steppe. Vegetation communities listed in the Basin and Range section of the Oregon Natural Heritage Plan which occur in the WSA are: mountain mahogany communities, aspen groves, low sagebrush/Idaho fescue, big sagebrush/bitterbrush/Idaho fescue and big sagebrush/bluebunch wheatgrass.

The WSA is within 5 hours' driving time of three standard metropolitan statistical areas with population over 100,000: Medford, Oregon; Redding, California and Reno, Nevada.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and data provided in a report by TERRADATA, a consulting firm under contract with BLM. The report is titled "Assessment of Geology, Energy, and Minerals Resources of the Crump Lake Geologic Resource Area." U.S. Bureau of Mines report MLA 60-87, "Mineral Resources of the Fish Creek Rim Study Area, Lake County, Oregon" completed in 1987 has also been incorporated into the mineral assessment of the WSA.

The WSA is within the Crump Lake geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume. The Crump Geyser Known Geothermal Resource Area (KGRA) encompasses 85,663 acres, 4,480 of which lie within the WSA.

Table 3 shows the mineral potential classifications for the WSA. Map 5 shows the portions of the WSA rated high for geothermal resources.

The rocks of the WSA are Tertiary basalt flows, tuffs and tuffaceous sedimentary rocks and Tertiary to Quaternary wind- and water-deposited sediments and landslide debris. The Tertiary rocks are exposed along the Fish Creek Rim fault block. Geology of the subsurface is unknown, but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

The 4,480 acres of the WSA within the Crump Geyser Known Geothermal Resource Area, on and east of the rim, have high potential for the occurrence of geothermal energy. Potential for the occurrence of oil and gas is considered to be low.

As of October 16, 1987, there were no leases for any energy resources.

Mineral Resources

After review of the TERRADATA study, BLM reviews and the recent cooperative study of the U.S. Bureau of Mines and the U.S. Geological Survey, the potential for the occurrence of diatomite, mercury, silver and gold is rated low in the WSA.

Except for road aggregate sources along the southern and eastern boundaries of the WSA, there are no known mineral deposits. As of October 16, 1987, there were no mining claims within the WSA.

Vegetation

The southern end of the WSA is mainly covered by a low sagebrush/Sandberg's bluegrass community above the rim and on the open area of Monument Flat. The rim on the south is primarily a western juniper/big sagebrush community. The northern part of the WSA is characterized by numerous stringers of aspen and juniper, and mountain mahogany thickets. Associated with the aspen communities are isolated ponderosa pines and white fir. The mountain mahogany thickets are interspersed with communities of big sage-bitterbrush/bluegrass or Idaho fescue communities. The steep scarps along the eastern border are covered with juniper, mountain mahogany, big sagebrush, currants, bitterbrush, bluebunch wheatgrass, Great Basin wildrye and wildflowers.

Vegetative communities in the WSA vary from early seral in one of the aspen groves and along the southern edge of the WSA to near potential natural community in the low sagebrush/Idaho fescue community.

Portions of the central part of the WSA have been studied by the Pacific Northwest Research Natural Area Committee for possible Research Natural Area (RNA) designation. The RNA, if designated, would encompass 1,280 acres, 1,000 acres of which lie within the WSA. The proposed RNA includes portions of the mountain mahogany community, the low sage/Sandberg's bluegrass, the low sage/Idaho fescue, and the big sage-bitterbrush/Idaho fescue communities.

A plant species of special interest, *Melica stricta* (strict onion grass or nodding melic), has been identified in the WSA. This plant species is on List 2 (Threatened in Oregon but More Common or Stable Elsewhere) of the Oregon Natural Heritage Data Base "Rare, Threatened, and Endangered Plants and Animals of Oregon, 1987."

Wildlife

Fish Creek Rim is a high-density nesting area for many species of raptors, including golden eagle; prairie falcon; merlin; and red-tailed, sharp-shinned and Cooper's hawks. On a 5-mile section of the rim, over 20 stick nests and falcon nesting sites have been observed. The rim is known as a historical peregrine falcon use area and there have been recent sightings of the birds; however, no active nests have been discovered. High potential reintroduction sites for this species are within the WSA. According to a study by the Wilderness Research Institute, Inc. published in 1982 ("Peregrine Falcon Nesting Habitat Survey Along Fish Creek Rim, Oregon") the best site along Fish Creek Rim for reintroduction is in a cliff area north of the WSA. The second most likely reintroduction site is within the WSA. Other suitable cliffs occur both inside and outside the WSA.

The entire WSA above the rim, about 12,100 acres, is year-round habitat for sage grouse, a candidate species for Federal Threatened and Endangered status.

The WSA now supports approximately 20 California bighorn sheep, 12 animals having been released in 1988 in an attempt to establish a self-sustaining population. Total habitat in the WSA is about 8,300 acres.

All of the WSA, except for a small portion of low sagebrush flats, is within the Deep Creek deer herd crucial winter range. The WSA, which contains 17 percent of the herd's crucial winter range, supports approximately 500 deer during the winter months. Winter habitat conditions are fair to good on most of the area. The herd condition is good, and numbers are increasing.

Between 150 and 175 pronghorn antelope occupy most of the WSA during the spring, summer and fall seasons. There is a kidding ground in the southwest portion of the WSA.

Other wildlife species include bobcat, coyote, jackrabbit, cottontail, chipmunks, mice, voles, rattlesnake, gopher snake, fence lizard, numerous species of insects and spiders, turkey vulture, blue grouse, rough-legged hawk, nighthawk, hairy and downy woodpeckers, sage thrasher, yellow-rumped warblers, mountain bluebird, rufous-sided towhee, white-crowned sparrow, savannah sparrow, barn swallow, pine grosbeak, red crossbill and purple finch.

Watershed

There are no perennial streams in the WSA.

Livestock Grazing

The WSA includes parts of five grazing allotments. Table 4 summarizes existing livestock use in AUMs and season of use.

Existing livestock projects in the WSA (among the features mentioned in the Naturalness section) include 22 small water developments and 4 miles of fence.

Permittees use motor vehicles along the 6 miles of ways for livestock inspections and salting twice a year. Livestock gathering and minor fence maintenance is done by horseback. Motor vehicles are used for major fence maintenance and heavy equipment is used for waterhole and reservoir maintenance once every 5 to 10 years.

Wood Products Harvest

There are 2,160 acres of juniper in the study area which could be harvested for fence poles and firewood. The majority of the trees are in the southern portion of the WSA in and around Sweeney Canyon. The remainder of the harvestable juniper is along the rim and in the northern portion of the WSA.

Cultural Resources

The WSA contains rock art sites, primitive hunting blinds, and at least one prehistoric bighorn sheep hunting complex.

Recreation Use

The principal vehicle-oriented recreation use of the area is hunting and sightseeing. Several hunter camps are located inside the WSA and along the boundary of the area at Cox and Cleland Springs. The area receives moderate to heavy hunting use. Many local residents use the area as a sightseeing location, driving to the rim north of the microwave tower and overlooking the landscape in all directions. Primitive recreation use at the present time is low in the WSA. Total recreation use is estimated to be approximately 500 visitor days per year.

Local Personal Income

Livestock use at the current level of 778 AUMs, and recreation use totaling 500 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use-levels amounts to approximately $9,000 for livestock grazing and $6,000 related to recreation use of the WSA, for an overall total of approximately $15,000. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in this WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The statewide volume discussed certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 16,690 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and wilderness values within the entire 16,690 acres would be protected by legislative mandate.

Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features, including raptor nesting habitat, bighorn sheep habitat, crucial winter deer winter range, sage grouse habitat, plant communities and species of special interest, cultural resources and outstanding scenery would also be protected.

Naturalness

The natural values on the scarp of Fish Creek Rim as well as the vegetative communities on and west of the rim would be preserved within a naturally-functioning ecosystem. Closure of 6 miles of ways would allow vegetative recovery on approximately 6 acres in 3 to 5 years thus enhancing the naturalness of 60 acres of the WSA. Maintenance of 22 waterholes and reservoirs every 5 to 10 years would have short-term impacts on vegetation along access routes.

Maintenance of a 3-mile dead-end access road to the microwave tower would continue to directly detract from the naturalness on 3 acres of the WSA due to maintenance activities with heavy equipment and vehicle traffic preventing revegetation of the route.

The powerlines, television antenna and the microwave facility would continue to detract from the naturalness of about 1,140 acres.

Solitude

Opportunities for solitude provided by the convolutions of the scarp and dense vegetation would be enhanced by the closure of 6 miles of ways within the WSA. These ways are primarily in areas of low topographic relief and low vegetation, therefore the elimination of vehicle traffic along their routes would improve opportunities for solitude in the area as a whole. Most vehicle traffic would be limited to the boundary roads and the 3-mile dead-end road to the microwave tower, thus providing a large area in which visitors can experience solitude. Short-term loss of solitude would occur while heavy equipment or vehicles are in use for waterhole or fence maintenance.

Primitive and Unconfined Recreation

Closure of 6 miles of ways within the study area would enhance the quality and esthetics of primitive and unconfined recreation by eliminating the presence and noise of vehicles, thus providing a more natural setting for these activities to take place. Preservation of natural systems would maintain opportunities to enjoy the primitive aspect of outdoor recreation activities such as camping, hunting, backpacking, birdwatching, photography and nature study.

Special Features

Bighorn sheep habitat would be preserved in a wild state conducive to the perpetuation of the species. Closure of 6 miles of ways would eliminate vehicle disturbance of these animals. Antelope habitat and one kidding ground, crucial mule deer winter range, and sage grouse habitat would likewise be enhanced.

Cultural resource sites would receive added protection from trespass collection due to the closure of 6 miles of access ways in the study area.

Conclusion: Wilderness designation of the entire 16,690 acres of the Fish Creek Rim WSA would result in protection and enhancement of existing wilderness values although powerlines, a television antenna and a microwave facility would continue to affect naturalness on 1,140 acres.

Impacts on Energy and Mineral Development

Wilderness designation would withdraw from all appropriations under mining and mineral leasing laws 16,070 acres of public land. The 620 acres of split-estate lands within the WSA would remain open to mineral exploration.

Energy Development

Exploration and development would be prohibited on 16,070 acres, 4,480 acres of which have a high potential for geothermal resources. Development of from 5 to 15 geothermal wells would be foregone. The remaining 80,563 acres of the KGRA on public and private lands outside the WSA would remain open to exploration and development. The 620 acres of split-estate land within the WSA would also remain open to energy exploration. Potential for energy resources on this acreage is low.

Conclusion: Development of 5 to 15 geothermal wells would be foregone.

Mineral Development

No moderate or high potential minerals occur in the WSA. Casual exploration would be foregone on 16,070 acres. No development is projected.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

Vegetative composition as described in the vegetation section in the Affected Environment would not change. Ecological status, which is near potential natural community in many portions of the study area, would also not change. The areas in early seral stage would remain in static or upward trend. The area's special interest plant, Melica stricta, would receive added legislative protection.

The closure of 6 miles of ways would allow for revegetation of approximately 6 acres on these routes in 3 to 5 years.

Conclusion: Six miles of ways would revegetate. Little or no change would occur to vegetation on the rest of the area.

Impacts on Wildlife

Wildlife habitat on 12,100 acres for the 500 mule deer, 150 to 175 antelope, 20 California bighorn sheep and an undetermined number of sage grouse would be enhanced under this alternative. Habitat would be enhanced by the closure of 6 miles of ways to vehicles, thus reducing the amount of disturbance to the populations, and by the preservation of the 16,690 acres in a wild, natural condition. Habitat for nongame wildlife species would also be preserved. Forage availability for wildlife is coordinated in conjunction with the livestock grazing allotment management plan.

Reintroduction of peregrine falcon to the area would not be impacted. Short-term management actions, such as vehicle access until young are hatched, would comply with BLM's Wilderness Management Policy.

Conclusion: Wildlife habitat and population levels would be maintained throughout the WSA, and would be enhanced by the closure of 6 miles of ways. Peregrine falcon would be reintroduced to their historic habitat.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of 778 AUMs within the portions of the 5 allotments in the WSA. Vegetative manipulation to increase in livestock forage by 164 AUMs, a proposed reservoir and 1 mile of fence to improve livestock distribution would be precluded due to potential adverse impacts on wilderness values. The use of vehicles for routine livestock checking on 6 miles of ways would be precluded, resulting in a slight inconvenience to livestock operators. Vehicle use along the 6 miles of ways would be excluded. The 3-mile road to the microwave site would remain open. Use of heavy equipment to maintain waterholes and reservoirs once every 5 to 10 years would continue. Permittees rely almost exclusively on horses for livestock management activities within the WSA.

Conclusion: A potential increase in forage allocation of 164 AUMs and opportunities to improve livestock distribution would be foregone. Vehicle use on 6 miles of way would be restricted, with some inconvenience and slight increased cost to livestock operators.

Impacts on Wood Products Harvest

Harvesting of scattered juniper for firewood and fence posts from 2,160 acres within the WSA would be precluded. Demand could be met outside the WSA.

Conclusion: The harvest of juniper from 2,160 acres would be foregone.

Impacts on Cultural Resources

Closure of 6 miles of ways to vehicles would limit access to cultural sites and offer protection to sites. Removal of artifacts would be more difficult without vehicles. Vandalism has been reduced in areas where vehicle access is denied.

Conclusion: Protection of cultural sites would be enhanced.

Impacts on Recreation Use

The dead-end road to the microwave tower would remain open, providing continued access to the rim by vehicle. The closure of 6 miles of ways within the WSA would be expected to displace approximately 50 visitor days per year associated with vehicle-oriented hunting.

Primitive recreation would be enhanced by the closure of 6 miles of ways, removing the visual and auditory impact of vehicles. Hunters, especially those hunting by horseback, would find hunting improved by the elimination of vehicles which disturb and move game. The revegetation of these ways would enhance the naturalness of the WSA, improving opportunities for photography and enjoyment of the scenery. With wilderness designation, primitive recreational use of the area would be expected to increase by approximately 100 visitor days per year.

Conclusion: Overall recreation use in the area would be expected to remain stable at approximately 500 visitor days per year or increase slightly. Recreation use would shift from vehicle-oriented to primitive forms.

Impacts on Local Personal Income

Livestock grazing would remain at 778 AUMs. Overall recreation use would remain at approximately 500 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $15,000.

Enhanced Wilderness

Recommended suitable for wilderness: 15,740 acres (includes acquisition of 400 acres of private land and 620 acres of mineral estate of split-estate land)
Recommended nonsuitable for wilderness: 1,350 acres

Impacts on Wilderness Values

The enhanced wilderness alternative would add 15,740 acres to the NWPS, assuming the acquisition of the 400-acre private land adjacent to the northwest boundary and 620 acres of mineral estate of split-estate land. Six miles of ways would be closed. These 15,740 acres would be designated wilderness, and wilderness values within this area would be protected by legislative mandate. Wilderness values of naturalness, solitude, and primitive and unconfined recreation would be preserved. Special features, including bighorn sheep and sage grouse habitat, crucial deer winter range and an antelope kidding ground, raptor nesting sites, cultural resources, and plant communities and species of special interest would also be protected. Acquisition of the mineral estate and private land would ensure the preservation of naturalness and opportunities for solitude and primitive recreation within the area as a whole.

Approximately 1,350 acres on the south end of the WSA would be recommended as nonsuitable for wilderness. The nonsuitable portion contains two powerline rights-of-way paralleling Highway 140. Wilderness values on these 1,350 acres would not receive legislative protection.

Naturalness

The effects on naturalness would be similar to the all wilderness alternative except that the enhanced wilderness alternative also includes the acquisition of 620 acres of mineral estate and 400 acres of private land from willing owners. The acquisition of these parcels would ensure the preservation of the area's naturalness by precluding their development.

Closure of 6 miles of ways within the WSA would enhance its naturalness by allowing for their revegetation in 3 to 5 years. These ways directly influence 6 acres and visually influence 60 acres. The naturalness of the suitable area would be improved with the exclusion of the powerlines, television antenna and microwave facilities.

Lands recommended nonsuitable on the south between the tower access road to highway 140 would continue to have impairments to naturalness due to maintenance of the microwave tower and its 3-mile access road. Juniper harvest by cross-country travel on 440 acres of the 1,350 acres nonsuitable would remove tree cover and leave short-term disturbance of soils and vegetation due to the passage of vehicles. Due to the dispersed location of harvestable trees, ways or roads would not be likely to develop as a result of this activity.

Solitude

Solitude within the WSA would be enhanced by the acquisition of private land and mineral estate, precluding development of those lands. Further enhancement of opportunities for solitude would result from the closure of 6 miles of ways, thereby eliminating visual intrusions and the noise associated with motorized vehicles. Short-term impacts to solitude will occur once every 5 to 10 years when equipment is used in the area to maintain waterholes.

Opportunities for solitude on the 1,350 acres recommended nonsuitable would continue to be impaired at intervals by right-of-way maintenance activities in that area. Short-term disturbance of solitude would occur due to juniper cutting activities and vehicle presence.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be enhanced under this alternative by the acquisition of 400 acres of private land and by the acquisition of mineral estate on 620 acres in the northern portion of the WSA. Preclusion of developments on these lands would maintain the natural condition of the WSA as a whole, preserving existing opportunities for nature study, photography, horseback riding, camping and hiking. Closure of 6 miles of ways would enhance opportunities for these same activities by removing the occasional disturbance of vehicle presence and noise.

These same opportunities would continue to be impacted at intervals by right-of-way maintenance activities along the powerlines in the 1,350 acres recommended nonsuitable. Harvest of juniper in this portion of the WSA would intermittently affect primitive recreation opportunities by disturbing the primitive setting.

Special Features

Most of the special features of the Fish Creek Rim WSA would be preserved and enhanced under this alternative, including habitat for bighorn sheep, sage grouse, crucial deer winter range and antelope kidding ground, the population of *Melica stricta,* native plant communities and cultural resources. The acquisition of 400 acres of private land and mineral estate on split-estate would enhance the overall wilderness values associated with these special features by precluding development.

Some rimrock which is providing potential raptor nesting sites is included in the 1,350 acres recommended nonsuitable under this alternative. Neither maintenance activities along two powerline rights-of-way nor juniper harvest are expected to impact the rimrock above.

Conclusion: The enhanced wilderness alternative would preserve and enhance existing wilderness values on 15,740 acres within the WSA and on acquired private and split-estate lands. Nonsuitable lands would be impacted on 440 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The enhanced wilderness alternative would withdraw 15,740 acres from all forms of appropriation under the mining and mineral leasing laws. This would include 400 acres of acquired private land and 620 acres of split estate with acquired mineral estate. The 1,350 acres recommended nonsuitable for wilderness would remain open to mineral entry.

Energy Development

Exploration and development of 4,220 acres with high potential for geothermal resources would be precluded. Projected development of from 5 to 15 geothermal wells would be foregone.

Approximately 500 acres with high potential for geothermal energy would be open to exploration in the southern portion of the WSA. This area contains steep terrain and development is not projected.

Conclusion: Projected development of 5 to 15 geothermal wells would be foregone. Exploration could occur on 500 acres with high potential found nonsuitable for wilderness.

Mineral Development

As no moderate or high potential for minerals is identified in the area, only casual, non-surface disturbing exploration would be expected. No development is anticipated.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

The enhanced wilderness alternative would protect and preserve existing natural vegetation, including habitat for a special-interest species *(Melica stricta)*, the stand of white fir, and native plant communities on 15,740 acres. Acquisition of private land and mineral estate would prevent development which could alter existing vegetation on 1,020 acres. Closure of 6 miles of ways would allow for revegetation of 6 acres in 3 to 5 years.

The proposed grazing allocation increase would not be allowed due to its potential impacts on wilderness values. Little or no change would take place to vegetation in the 15,740 acres recommended suitable as wilderness. Ecological status as described in the vegetation section in the Affected Environment would remain unchanged.

On the 1,350 acres recommended nonsuitable, natural vegetation would be impacted by wood products harvest on 440 acres where juniper-cutting for firewood and fence poles would occur. Harvest would not change ecological status of the vegetation, though short-term removal or damage to vegetation would occur from cross-country vehicle travel and the removal of selected trees.

Conclusion: Existing vegetation would be preserved on 15,740 acres. Six miles of ways would revegetate. Any future disturbance to vegetation by development on the split-estate and private lands would be precluded. Approximately 440 acres would be subject to short-term disturbance and removal of selected juniper trees.

Impacts on Wildlife

The impacts on wildlife under this alternative would be similar to the all wilderness alternative. Habitat for an expanding population of California bighorn sheep on 8,300 acres of habitat, for the 150 to 175 antelope and 500 wintering mule deer, as well as for raptors such as peregrine falcon, sage grouse (12,100 acres) and other wildlife species would be maintained under wilderness designation. Forage availability for wildlife would be coordinated in conjunction with the livestock grazing allotment management plan.

Closure of 6 miles of ways would enhance wildlife habitat, providing a large area where wildlife would not be disturbed by vehicles.

All of the 1,350 acres recommended nonsuitable are crucial mule deer winter range. Wood-cutting within the 440 acres suitable for harvest would reduce thermal and escape cover for mule deer, as well as habitat for cavity-nesting species. A segment of rimrock which could provides raptor nesting habitat lies within the 1,350 acres recommended nonsuitable.

Conclusion: Wildlife habitat and populations would be preserved and enhanced on 15,740 acres. Cutting of selected juniper on 440 acres would have a minor impact on mule deer and on cavity-nesting species. Peregrine falcon would be reintroduced.

Impacts on Livestock Grazing

Existing utilization of approximately 778 AUMs within the WSA would continue. Burn-and-seed treatments on 800 acres and construction of a reservoir and one mile of fence would be precluded. A potential increase of 164 AUMs and an opportunity to better distribute livestock would be foregone. The closure of 6 miles of ways to routine livestock checking would cause a minor inconvenience and slight added expense to livestock operators. Heavy equipment would be used every 5 to 10 years for maintenance of the 22 reservoirs and waterholes. All other livestock management activities, including fence maintenance, would be accomplished by horseback.

Livestock grazing practices on the 1,350 acres recommended nonsuitable would remain unchanged. None of the watering facilities are located in this portion of the WSA. There are no livestock projects proposed for this acreage.

Conclusion: A potential increase of 164 AUMs and the opportunity to better distribute livestock would be foregone. Closure of 6 miles of way would cause minor inconvenience and a slight increase in cost to the livestock operators.

Impacts on Wood Products Harvest

The cutting of selected trees from 1,720 acres within the suitable portion would be precluded. Demand could be met from the 440 acres available in the nonsuitable portion and areas outside of the WSA.

Conclusion: Wood products harvest would be foregone on 1,720 acres.

Impacts on Cultural Resources

This alternative would protect the removable cultural resources within the WSA by closing vehicle access on 6 miles of ways. Protection of archeological sites would be enhanced by the acquisition of 400 acres of private land and of the mineral estate of 620 acres by precluding surface-disturbing activities on these 1,020 acres.

Conclusion: Cultural sites would receive added legislative protection on 15,740 acres.

Impacts on Recreation Use

The dead-end road to the microwave tower would remain open to vehicles, affording the continuation of vehicle-borne sightseeing to the rim. Closure of 6 miles of ways would displace hunters dependent on vehicles. Approximately 50 visitor days per year of vehicle-related recreation would be foregone.

Primitive recreation activities would be enhanced by the closure of 6 miles of ways and by the acquisition of private lands and the mineral estate of split-estate lands by precluding vehicle access and development of interior parcels. Wilderness designation and increased public awareness of the opportunities for primitive recreation would be expected to attract additional primitive use by approximately 100 visitor days per year. Total use is expected to remain at approximately 500 visitor days per year or to increase slightly.

Recreational use of the 1,350 acres recommended nonsuitable is limited to a few visitor days per year associated with hunting and day hiking. Wood-cutting activities could have a minor impact on primitive recreation on 440 acres.

Conclusion: Recreation use would be expected to shift from primarily vehicle-oriented recreation to primitive types of recreation with use levels remaining at approximately 500 visitor days per year or increasing slightly.

Impacts on Local Personal Income

Livestock grazing would remain at 778 AUMs and overall recreation use would remain at 500 visitor days per year. Juniper harvest for firewood and posts could occur on 440 acres.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level, plus an unknown level of increase attributable to the sale of juniper.

Conclusion: Annual personal income generated from resource outputs in the WSA would remain at approximately $15,000.

Partial (Proposed Action)

Recommended suitable for wilderness: 11,920 acres
Recommended nonsuitable for wilderness: 4,770 acres

Impacts on Wilderness Values

The partial alternative would designate 11,920 acres as wilderness, affording protection of wilderness values by legislative mandate. The area's outstanding opportunities for solitude, primitive and unconfined recreation, and special features (including cultural resources, bighorn sheep and sage grouse habitat, crucial deer winter range and antelope kidding ground, raptor nesting habitat, native vegetation and a plant species of special interest) would be retained on the 11,920 acres. The mineral estate on 620 acres of split-estate land on the central portion of the WSA would be acquired from willing owners, thereby providing enhancement of the wilderness values by ensuring that mineral exploration and development would not occur.

Wilderness values on the 4,770 acres recommended nonsuitable would not receive special legislative protection and would be impacted by livestock and wildlife developments, wood products harvest and continued vehicle use.

Naturalness

The naturalness of 11,920 acres, including much of the vegetative diversity of the WSA, would be preserved under this alternative. The acquisition of 620 acres of mineral estate would preclude any adverse impacts from future development, thus preserving the naturalness of the area. Closure of 3 miles of ways to vehicles would allow for revegetation of 3 acres in 3 to 5 years, eliminating their unnatural influence on 30 acres. The naturalness of the suitable area would be improved with the exclusion of the powerlines, television antenna and microwave facilities.

On the 4,770 acres recommended nonsuitable, vegetative manipulation on 600 acres from two burn-and-seed projects would impact naturalness on those acres and would visually affect an additional 200 acres. Placement of one wildlife guzzler would directly impact 0.1 acre and visually affect 2 acres. Continued vehicle use on 3 miles of ways would continue to have an impact on naturalness of about 30 acres along their routes by preventing reestablishment of vegetation in the tracks. Juniper harvest on approximately 1,560 acres would cause short-term disturbance from vehicle entry and long-term impact to natural appearance from remaining stumps.

Solitude

The closure of 3 miles of ways under this alternative would enhance opportunities for solitude on approximately 30 acres affected by vehicle use on the ways.

Vehicle use on 3 miles of ways and 3 miles of road in the portion recommended nonsuitable would continue to impact opportunities for solitude on approximately 30 acres. Casual exploration on 500 acres with high potential for geothermal resources would have a localized and temporary impact on solitude. Development is not anticipated on these 500 acres due to steep terrain. Short-term impacts to solitude would occur every 5 to 10 years when heavy equipment is used to maintain waterholes and reservoirs.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation in a natural setting would be preserved on the 11,920 acres recommended suitable by eliminating vehicle traffic on 3 miles of ways (affecting 30 acres). Acquisition of 620 acres of mineral estate would preclude their future development.

Continued vehicle use on 3 miles of ways, cutting of selected juniper from 1,560 acres, and energy-related exploration activities on the 500 acres within the 4,470 acres recommended nonsuitable would intermittently reduce opportunities for primitive and unconfined recreation.

Special Features

Under the partial alternative, wilderness designation would protect the *Melica stricta* habitat and all of the natural plant communities under consideration for RNA designation. All of the east-facing scarp with its high-density raptor nesting habitat, 6,800 acres of the WSA's sage grouse habitat and 5,800 acres of the bighorn sheep habitat would also be preserved. Antelope habitat (and one kidding ground) and crucial deer winter range within the suitable portion would be preserved. The majority of the cultural resources and the scenic values of approximately 70 percent of the WSA would also receive special legislative protection. The acquisition of the mineral estate of 620 acres of split-estate lands would enhance overall wilderness values associated with these special features by precluding development.

The nonsuitable portion includes 5,300 acres of sage grouse habitat, and 2,500 acres of bighorn sheep habitat which would not receive special legislative protection. Proposed burn-and-seed projects would reduce sage grouse habitat on 600 acres. Antelope habitat would be improved by burn-for-release on 200 acres and the placement of one guzzler. Cutting of juniper on 1,560 acres would impact crucial mule deer winter range by reducing thermal and escape cover. Continued vehicle use on 3 miles of ways would cause occasional disturbance to bighorn sheep, wintering mule deer and sage grouse.

Conclusion: Wilderness designation would result in protection of existing wilderness values and enhancement of these values on 11,920 acres. On the 4,770 acres not designated wilderness, projected activities would directly or indirectly impair wilderness values on approximately 2,100 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Under the partial alternative, a total of 11,920 acres would be withdrawn from appropriations under the mining and mineral leasing laws. The remaining 4,770 acres would be open to mineral exploration and energy development.

Energy Development

Exploration for geothermal resources, which have a high potential for occurrence on 3,980 acres within the suitable portion, would be precluded. Development of 5 to 15 geothermal wells within the WSA would be foregone.

A total of 500 acres with high potential for geothermal resources within the nonsuitable portion would be open to energy exploration. Terrain would not be suitable for development on this 500 acres.

Conclusion: From 5 to 15 geothermal wells would be foregone in the area suitable for wilderness.

Mineral Development

Due to the lack of moderate or high potential for minerals in the WSA, only casual exploration, without development, is expected on the 11,920 acres suitable for wilderness. Casual exploration would occur on the 4,770 acres nonsuitable, but no development is anticipated.

Conclusion: There would be no impact to mineral development.

Impacts on Vegetation

Little or no change would take place to the vegetation in the portion recommended suitable for wilderness. Natural vegetation, including the association of plants in the proposed Research Natural Area and the *Melica stricta* population, would be preserved under this alternative. Vegetative composition as described in the vegetation section in the Affected Environment, would not be changed. Ecological status, which is mainly near potential natural community, with some areas in early seral stage with static to upward trend, would also not change. Closure of 3 miles of ways allow for the revegetation of 3 acres in 3 to 5 years.

On the 4,770 acres recommended nonsuitable, selected trees would be harvested over 1,560 acres. Two burn-and-seed treatments totaling 600 acres would reduce sagebrush and introduce an exotic species. Three miles of ways would remain open to vehicle access, resulting in continued impact to vegetation along these routes.

Conclusion: Natural vegetation would be preserved on 11,920 acres. Vegetation would be altered on 600 acres and selected trees would be removed from an area of 1,560 acres. Three miles of ways would revegetate.

Impacts on Wildlife

Wildlife habitat for the approximately 500 wintering mule deer, 20 California bighorn sheep, 150 to 175 antelope and an undetermined number of sage grouse (11,500 acres), as well as for raptors and other nongame wildlife species, on 11,920 acres of the study area would be maintained. Forage availability for wildlife would be coordinated in conjunction with the livestock grazing allotment management plan. Closure of 3 miles of ways would reduce minor seasonal vehicle disturbance of big game and upland game bird species.

A 200-acre burn-and-seed to improve antelope habitat and the installation of a wildlife guzzler would be realized in the portion recommended nonsuitable. The seeding would provide early season forage for antelope and mule deer. It would also remove sagebrush and introduce a non-native species of grass, removing habitat for other wildlife species such as sage grouse and small mammals and birds. Another burn-and-seed treatment for livestock on 400 acres would also impact sage grouse and small mammals and birds in the same manner.

There would be no impact to peregrine falcon reintroduction.

Conclusion: Wildlife habitat and population levels would be maintained on 11,920 acres. Antelope habitat would be enhanced on 200 acres. Sage grouse habitat would be altered on 600 acres. Thermal and escape cover for wintering mule deer and habitat for cavity-nesting species would be reduced by juniper harvest.

Impacts on Livestock Grazing

Current livestock grazing use would continue at the existing level of 560 AUMs in the portion recommended suitable; opportunity to seed approximately 400 acres to increase forage allocation by 81 AUMs would be precluded due to potential impacts to wilderness values. A reservoir and fence designed to better distribute livestock below the rim in a small allotment would also be precluded. Vehicle access for livestock management activities would be excluded on 3 miles of ways. Heavy equipment would be used once every 5 to 10 years to maintain 12 reservoirs and waterholes. All other livestock management activities, including fence maintenance, would be accomplished on horseback.

In the nonsuitable portion, burn-and-seed treatment of 400 acres would be realized, increasing forage availability by 83 AUMs. Three miles of ways and 3 miles of road would remain open to vehicle access; management activities on this acreage would continue as currently practiced.

Conclusion: A potential increase in forage allocation of 81 AUMs would be foregone. An 83-AUM increase would be realized in the nonsuitable portion. Vehicle use of 3 miles of ways would be restricted, resulting in a minor inconvenience to livestock operators.

Impacts on Wood Products Harvest

Juniper harvest on 600 acres would be precluded due to potential impacts to wilderness values. Approximately 1,560 acres would be open to harvest in the nonsuitable portion.

Conclusion: Cutting of juniper on 600 acres would be foregone.

Impacts on Cultural Resources

Most of the archeological sites in the Fish Creek Rim WSA are within the portion recommended suitable for wilderness under the partial alternative, offering additional legislative protection to this resource. Sites in the nonsuitable portion could be subject to disturbance due to continued vehicle access.

Conclusion: This alternative would give added legislative protection to cultural resource sites within the 11,920 acres suitable for wilderness.

Impacts on Recreation Use

Vehicle access to the microwave site from Highway 140 would remain open, thereby allowing the continuance of vehicle-oriented sightseeing from the south part of the rim. Closure of 3 miles of ways would slightly displace vehicle-oriented recreation, resulting in a minor decline of approximately 50 visitor days per year. Primitive recreation activities such as hunting, backpacking, day-hiking, camping, photography and nature study would be enhanced in the central part of the portion recommended suitable by the closure of 3 miles of ways to vehicles. Sightseeing opportunities would be preserved by the preclusion of geothermal energy development below the rim. Primitive types of recreation are expected to increase by approximately 100 visitor days per year with wilderness designation.

The nonsuitable 4,470 acres, which include 3 miles of ways, would remain open to vehicle use. Vehicle-oriented hunting and sightseeing in the southern and northern portions of the study area would not be impacted.

Conclusion: Vehicle-oriented recreation would continue on 4,770 acres. Primitive recreation opportunities would be preserved on 11,920 acres. The overall recreational use is expected to remain at approximately 500 visitor days per year or to increase slightly.

Impacts on Local Personal Income

Livestock grazing would increase by 83 AUMs, increasing local personal income by approximately $1,000. Further increases in income would result from juniper harvest from 1,560 acres. Overall recreation use would remain at 500 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $1,000 per year, plus an unknown level of increase from the sale of juniper.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $1,000.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 16,690 acres

Impacts on Wilderness Values

Under this alternative, the entire 16,690 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and the area's special features, including wildlife habitat, natural vegetative communities and a plant species of special interest *(Melica stricta)*, cultural resources and scenic values would be subject to the effects of the projected management actions. These projected actions include development of 5 to 15 geothermal wells, wood products harvest, vegetative manipulation on 1,000 acres for livestock and wildlife (with an associated increase in allocation of 164 AUMs of livestock forage), construction of a mile of fence and one reservoir, installation of a wildlife guzzler and continued vehicle access on 6 miles of ways.

Naturalness

Vehicle use on 6 miles of ways would continue to impact naturalness directly on 6 acres and indirectly on 60 acres. Exploration for geothermal energy and the construction and operation of 5 to 15 geothermal wells would negatively impact the naturalness and scenic qualities on 120 acres of Fish Creek Rim. Native plant communities would be altered on 1,000 acres by vegetative manipulation. These burn-and-seed treatments would visually affect an additional 700 acres. Approximately 2,160 acres would be available for the harvest of juniper for firewood and fence poles, further impacting the naturalness of the study area with the visual effects of stumpage and waste. Construction of a reservoir and of one mile of fence would visually affect the appearance of naturalness on approximately 20 acres. Installation of one wildlife guzzler would directly affect 0.1 acre and visually impact two acres.

Solitude

Geothermal development within the WSA would reduce opportunities for solitude on 120 acres at the base of the scarp. Continued vehicle access for recreation and increased livestock use would also impact opportunities for solitude by the presence of vehicles. Harvest of juniper would affect solitude in the immediate vicinity of the wood cutting and over a larger area affected by the noise associated with vehicles and chain saws.

Primitive and Unconfined Recreation

Vehicle use would continue to be limited to existing ways, with minimal off-road travel due to the rocky terrain. Under the no wilderness/no action alternative, opportunities for primitive and unconfined recreation would be reduced by harvest of selected juniper from 2,160 acres and by geothermal development on 120 acres.

Special Features

Continued vehicle use on 6 miles of ways would maintain seasonal disturbance of the populations of bighorn sheep, antelope, wintering mule deer, sage grouse and other wildlife species. Sage grouse habitat would be altered on 1,000 acres by three proposed burn-and-seed treatments.

Cultural resources could be subject to trespass collection and vandalism by continued vehicle access on 6 miles of ways.

Conclusion: In the absence of wilderness designation, projected activities would impact and impair wilderness values on approximately 4,000 acres, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire 16,690 acres would be open to mineral entry.

Energy Development

Exploration and development would be permitted for geothermal resources. Projected development of from 5 to 15 geothermal wells would occur to supply a power plant outside the WSA.

Conclusion: Projected development of 5 to 15 geothermal wells affecting 120 acres would not be impacted.

Mineral Development

All 16,690 acres would be open to mineral entry. As no moderate or high potential exists, only casual exploration (with no development) is expected.

Conclusion: There would be no impact on mineral development.

Impacts on Vegetation

Vegetative manipulation on approximately 1,000 acres would remove natural communities and introduce non-native plant species, resulting in conversion of ecological status to an earlier seral stage. An increase in allocation of livestock forage of 164 AUMs would result in a corresponding increase in the grazed appearance. Harvest of juniper would remove selected trees from 2,160 acres. Construction of one reservoir and one mile of fence would alter vegetation on 2 acres. Two acres would be directly affected by geothermal well drilling with removal of vegetation, with up to 120 acres disturbed by pipeline construction associated with the wells. Ecological status in these areas would be affected locally, resulting in a 50 to 80 percent setback in progression towards potential natural community. Little or no change would take place to vegetative composition or ecological status on the rest of the WSA.

The 6 miles of ways would not revegetate due to continued use.

Conclusion: A no wilderness action would alter natural vegetation over approximately 3,300 acres of the WSA.

Impacts on Wildlife

Two burn-and-seed projects for livestock involving 800 acres would alter wildlife habitat on these acres by removing natural vegetation and introducing a non-native species of grass. The resulting 164-AUM increase could have a continuing impact on wildlife populations due to removal of residual ground cover. Another 200 acres of burn-and-seed treatment for antelope would enhance early season forage for this species. Habitat for other wildlife species including sage grouse (candidate species for Federal Threatened and Endangered status) would be reduced due to removal of sagebrush and other native plant species and by the introduction of an exotic species. Installation of a wildlife guzzler would benefit both game and nongame wildlife species.

Six miles of ways would remain open to vehicle use, causing continued local seasonal disturbance to bighorn sheep, antelope, wintering mule deer and sage grouse.

Nesting habitat of peregrine falcons could be negatively affected by secondary impacts of geothermal development outside the WSA, notably power transmission lines.

Conclusion: Wildlife populations of game and nongame species would sustain local seasonal disturbance due to continued vehicle use. Antelope habitat would be improved on 200 acres. Habitat for sage grouse would be reduced on 1,000 acres. Habitat for peregrine falcon could be adversely affected by geothermal development.

Impacts on Livestock Grazing

All 6 miles of vehicle ways would remain open for livestock management activities. Vegetative manipulation on 800 acres to increase livestock forage by 164 AUMs and the construction of a reservoir and one mile of fence would better distribute the livestock within two allotments.

Conclusion: A 164-AUM increase in licensed livestock use and the construction of a reservoir and one mile of fence to better distribute livestock would be realized.

Impacts on Wood Products Harvest

The 2,160 acres of juniper would be open to harvest.

Conclusion: Selected juniper could be harvested on 2,160 acres.

Impacts on Cultural Resources

The archeological sites within the study area would continue to be subject to trespass collection and vandalism due to ease of access on 6 miles of ways.

Conclusion: Cultural resources would continue to be exposed to damage.

Impacts on Recreation Use

Vehicle-oriented recreation would continue on 6 miles of ways. Recreation would remain focused on non-primitive uses associated with vehicle-oriented sightseeing and hunting. User levels would remain stable at approximately 500 visitor days per year.

Conclusion: The area's recreation use level of approximately 500 visitor days per year would not be affected.

Impacts on Local Personal Income

Livestock grazing would increase by 164 AUMs, while juniper harvest would be allowed on the 2,160 acres containing juniper. Projected energy exploration would occur, with possible development of 5 to 15 geothermal wells. Overall recreation use would remain at approximately 500 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $2,000 per year, plus an unknown level of increase attributable to sale of juniper and projected energy development.

Conclusion: Annual personal income generated from resource outputs in the WSA would increase by approximately $2,000.

Unavoidable Adverse Impacts of the Proposed Action

The Proposed Action, the Partial Alternative, would result in the alteration of the vegetation on approximately 600 acres, reducing naturalness and the complexity of ecological relationships on those acres and surrounding lands. Projected juniper harvest on 1,560 acres would affect naturalness on those acres. Cumulative impacts, both direct and indirect, on wilderness values would affect approximately 2,100 acres. Closure of 3 miles of ways would slightly reduce opportunities for those who prefer vehicle-oriented recreation. Geothermal development of 5 to 15 wells within the 11,920 acres recommended suitable would be foregone.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long Term Productivity

Under the Proposed Action, existing short-term uses would continue, with some restriction of vehicle access for livestock management activities resulting in a minor inconvenience to livestock operators. The long term productivity of the wilderness values would be preserved on the area recommended suitable.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area recommended suitable under the Partial Alternative would be fully manageable as wilderness because it would eliminate most potential conflicts from development, or future impacts from development on adjacent private land.

Rationale for the Selection of the Proposed Action

The Partial Alternative is the proposed action because, in the portion recommended suitable, the benefits of preserving wilderness values, (including habitat for bighorn sheep, antelope, mule deer, sage grouse and raptors; cultural resources; native vegetation and scenic values) would outweigh the benefits of development for livestock and minor wood products harvest. Potential for geothermal development within these 11,920 acres would not be developed, however the majority of the KGRA, including the most likely sites for development, lies outside the WSA.

Areas recommended as nonsuitable for wilderness contain powerlines, a television antenna and microwave facilities, and also have potential for development of livestock grazing projects and geothermal energy. The benefits of excluding the existing developments of realizing potential developments would outweigh the benefits of preserving wilderness values in those portions of the WSA.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to the Fish Creek Rim WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: The appendix does not indicate if the proposed RNA is entirely within the WSA. **Response:** Approximately 1,000 acres of the proposed RNA lies within the Fish Creek Rim WSA. The size of the RNA has been reduced to 1,280 from the original 3,000-acre proposal. This information has been added to the Special Features section of Affected Environment.

Comment: The appendix does not adequately discuss the area's potential for peregrine falcon reintroduction. **Response:** This information has been added to the Wildlife section of the Affected Environment and discussion included in the impacts section for each alternative considered.

Comment: The appendix does not adequately address a proposed utility corridor. **Response:** A proposed east-to-west corridor could be moved to bypass the WSA.

Comment: The appendix fails to explain the issue of rights-of-way. **Response:** Existing rights-of-way constitute prior existing rights. No new rights-of-way would be allowed within the WSA.

Comment: The appendix fails to evaluate the effect of the 750-kV powerline. **Response:** The effect of developments which lie outside the WSA is discussed in the Naturalness section of the Affected Environment. The powerline and the microwave tower site on the rim above Adel have a minor visual impact within the WSA.

Table 1. Summary of Proposed Management Under Each Alternative, Fish Creek Rim WSA (OR-1-117)

Proposed Management	All Wilderness	Enhanced Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	16,690	15,340	11,920	0
Acres Closed to ORVs by Wilderness Designation	16,690	15,340	11,920	0
Miles of Ways Closed	6	6	3	0
Acres of Full Fee Estate Acquired [1]	0	400	0	0
Acres of Mineral Estate Acquired [2]	0	620	620	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	16,070	14,720	11,300	0
Geothermal Wells Developed	0	0	0	5-15
Structural Wildlife Projects Developed: guzzlers (number)	0	0	1	1
Vegetative Manipulation for Wildlife: Brush Control with Seeding (acres)	0	0	200	200
Structural Livestock Projects Developed:				
Reservoirs & Waterholes (number)	0	0	0	1
Fences (miles)	0	0	0	1
Vegetative Manipulation for Livestock: Brush Control with Seeding (acres)	0	0	400	800
Livestock Allocation Increase (AUMs)	0	0	83	164
Acres of Suitable Minor Forest Products Available for Harvest	0	440	1,560	2,160

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use and withdrawn from mineral location and leasing.
[2] Upon acquisition of mineral estate, these lands would be withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Fish Creek Rim WSA (OR-1-117)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 16,690 acres would result in protection and enhancement of existing wilderness values.	Wilderness designation of 15,740 acres (assuming acquisition of 400 acres of private land and 620 acres of mineral estate) would protect and enhance existing wilderness values. Juniper harvest of selected trees from 440 acres in the non-suitable portion would have a minor impact on wilderness values.	Wilderness designation of of 11,920 acres (assuming acquisition of 620 acres of mineral estate) would protect and enhance wilderness values.	Projected management actions would impair wilderness values on 4,000 acres.
Energy and Mineral Development	Development of 5 to 15 geothermal wells would be foregone.	Development of 5 to 15 geothermal wells would be foregone.	Development of 5 to 15 geothermal wells would be foregone.	No impact to mineral or energy development.
Vegetation	Six miles of ways would revegetate. Little or no change would occur to vegetation on the rest of the area.	Six miles of ways would revegetate. Selected juniper would be cut from 440 acres in the nonsuitable portion. Little or no change would occur on the rest of the area.	Three miles of ways would revegetate. Vegetation would be altered on 600 acres by burn-and-seed treatments. Selected trees would be cut from 1,560 acres. Little or no change would occur to vegetation on the rest of the area.	Vegetation would be altered on 1,000 acres by vegetative manipulation, on 2,160 acres by juniper harvest, on 120 acres by geothermal development, on 2 acres by fence and reservoir construction. Utilization would increase by 164 AUMs with a corresponding decrease in ground cover.
Wildlife	Habitat and populations would be maintained throughout the area. Peregrine falcon would be reintroduced.	Habitat and populations would be maintained on 15,740 acres. Selected cutting of juniper on 440 acres would impact mule deer and cavity-nesting species. Peregrine falcon would be reintroduced.	Habitat and populations would be maintained on 11,920 acres. Antelope habitat would be enhanced on 200 acres. Sage grouse habitat would be altered on 600 acres. Juniper cutting on 1,560 acres would impact mule deer and cavity-nesting species. Peregrine falcon would be reintroduced.	Wildlife would sustain minor seasonal disturbance due to vehicle use. Habitat for sage grouse would be altered on 1,000 acres. Antelope habitat would be improved on 200 acres. Mule deer and cavity-nesting species would be impacted by the removal of selected juniper from 2,160 acres. Peregrine falcon would be reintroduced, with possible adverse impacts from geothermal development outside the WSA.
Livestock Grazing	Potential increase of 164 AUMs foregone. Vehicle use limited on 6 miles of ways with some inconvenience and slight increase in cost to livestock operators.	Potential increase of 164 AUMs foregone. Vehicle use limited on 6 miles of ways with some inconvenience and slight increase in cost to livestock operators.	Potential increase of 81 AUMs foregone. Increase of 83 AUMs realized. Vehicle use on 3 miles of ways limited with slight inconvenience to livestock operators.	Increase in livestock forage allocation of 164 AUMs would be realized. One reservoir and 1 mile of fence to improve livestock distribution would be realized.
Wood Products	Harvest of juniper from 2,160 acres precluded.	Harvest of juniper from 1,720 acres precluded.	Harvest of juniper from 600 acres precluded.	Selected juniper could be harvested on 2,160 acres.
Recreation Use	Recreation use level not affected. There would be a change to primitive non-motorized types of recreation use.	Recreation use level not affected. There would be a change to primitive non-motorized types of recreation use on 15,740 acres recommended suitable for wilderness.	Recreation use level not affected. There would be a change to primitive types of recreation on the 11,920 acres recommended suitable for wilderness.	There would be no change in the level or type of existing use.
Local Personal Income	Local personal income would remain at approximately $15,000.	Local personal income would remain at approximately $15,000.	Annual local personal income would increase by approximately $1,000.	Annual local personal income would increase by approximately $2,000.

Table 3. Classification of Energy and Mineral Potential, Fish Creek Rim WSA (OR-1-117)

Commodity	Level of Area	Level of Potential	Certainty
Metals (mercury, gold, silver)	Entire WSA	L	C
Geothermal	See Map 5	H	D
	Rest of WSA	L	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	0	C
Bentonite	Entire WSA	0	A
Diatomite	See Map 5	L	C
	Rest of WSA	0	B
Zeolites	Entire WSA	L	B

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

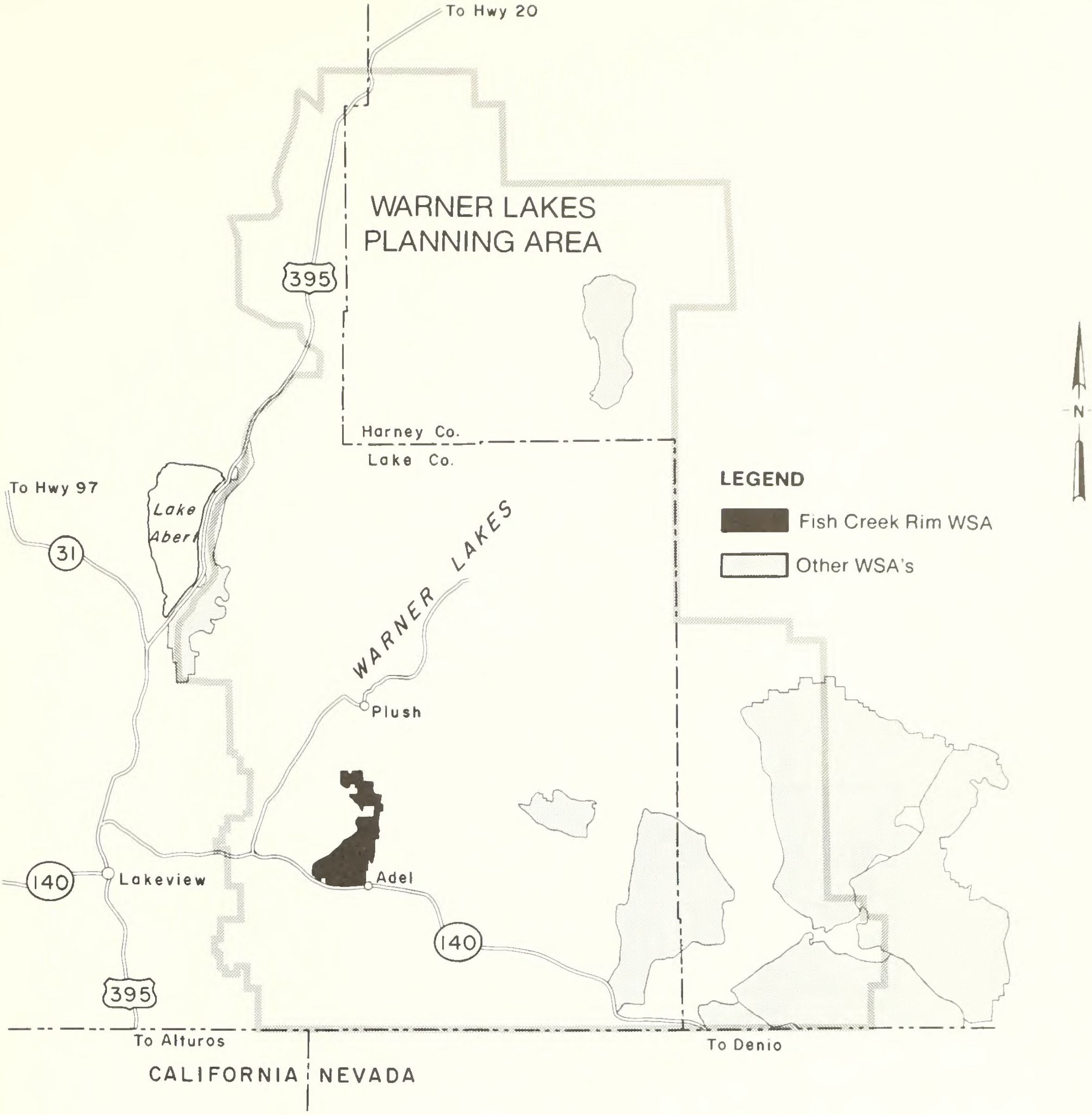
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

Table 4. Existing Livestock Use, Fish Creek Rim WSA (OR-1-117)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Hickey Ind. (No. 202)	519	04/10-09/25	59	306
Vinyard (No. 201)	510	04/10-09/31	28	133
Crump (No. 204)	92	04/16-06/15	100	92
Lane Plan 2 (No. 206)	450	04/10-07/10	15	67
Lynch-Flynn (No. 520)	882	05/01-07/15	13	115
No. 524	65	03/01-02/28	100	65
Total	2,518			778

Table 5. Effects of Alternatives on Local Personal Income, Fish Creek Rim WSA (OR-01-117) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Livestock Grazing	AUMs	No Change	No Change	+ 83	+ 164
Recreation Use	RVD	No Change	No Change	No Change	No Change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES					
Livestock Grazing	$	0	0	+1,000	+2,000
Recreation Use	$	0	0	0	0
Total	$	0	0	+1,000	+2,000



U. S. Department of the Interior
Bureau of Land Management

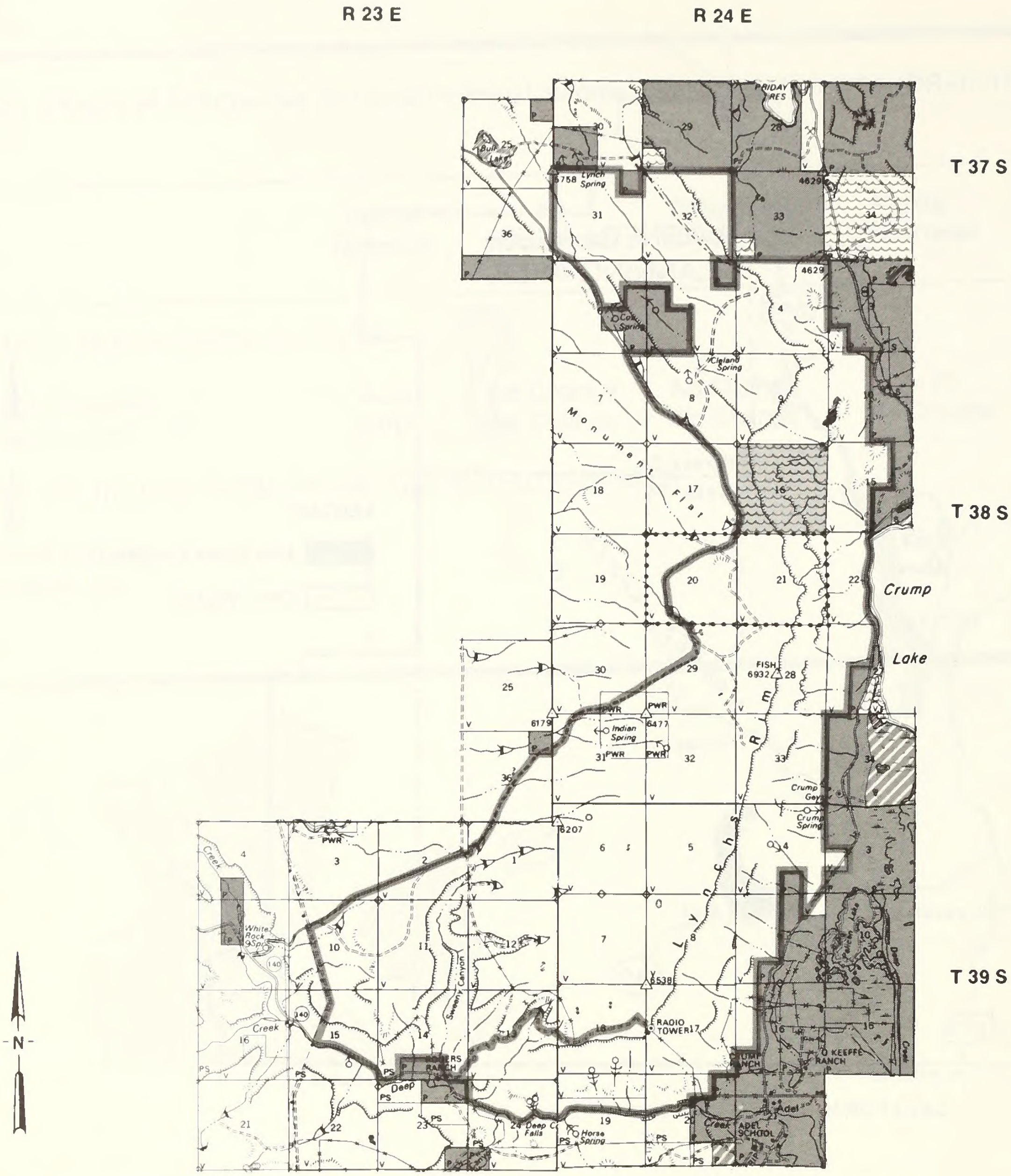
Lakeview District

Fish Creek Rim WSA
OR-1-117

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▣ BLM Land Studied Under Section 202 of FLPMA (Other BLM Land in WSA Studied Under Section 603 of FLPMA)
- — Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ≋ BLM Surface-State or Private Subsurface (Split Estate)
- ⬚ Proposed Research Natural Area

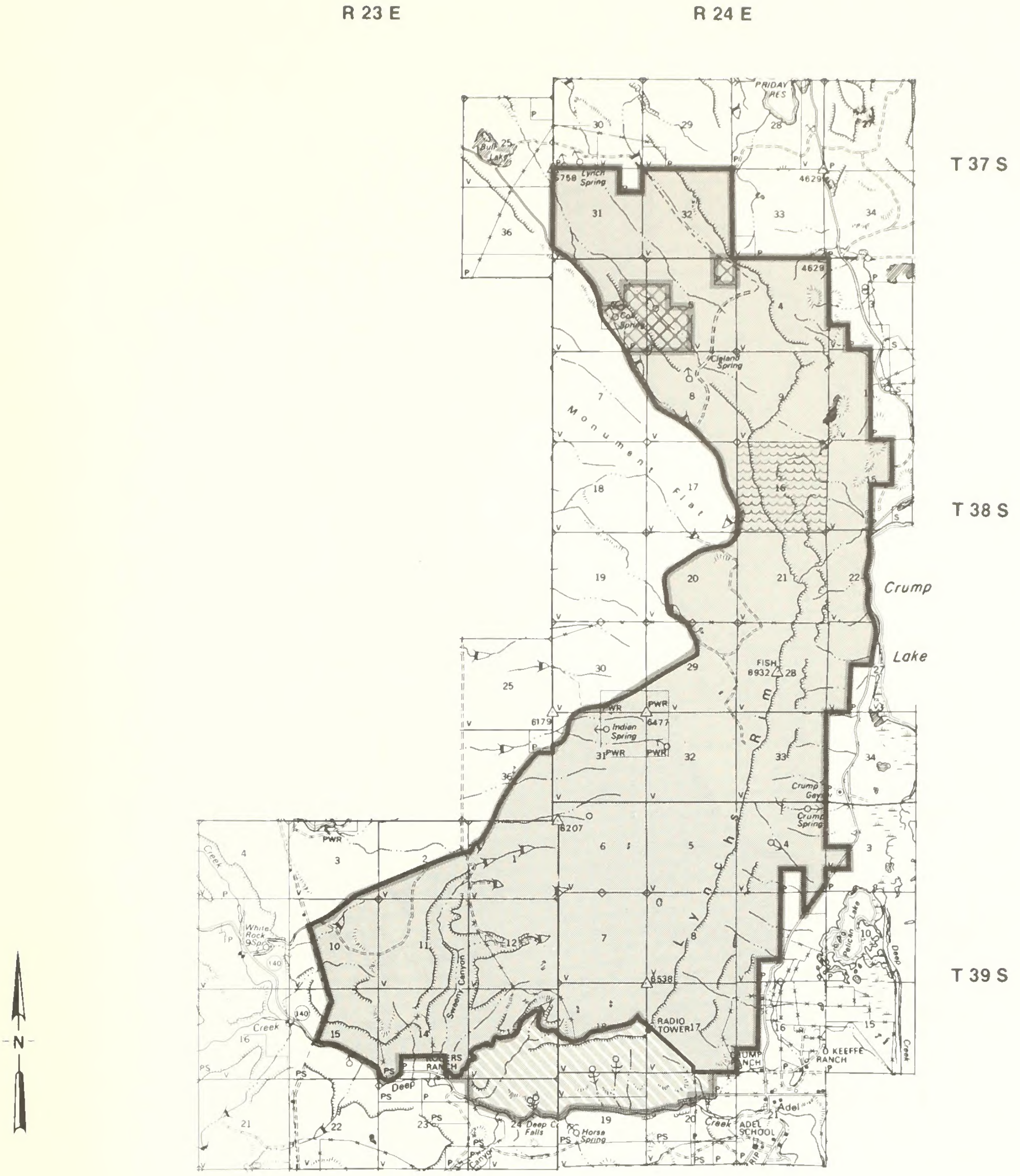
U. S. Department of the Interior
Bureau of Land Management
Lakeview District

Fish Creek Rim WSA
OR-1-117

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ **Wilderness Study Area Boundary**

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

≋ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

U. S. Department of the Interior
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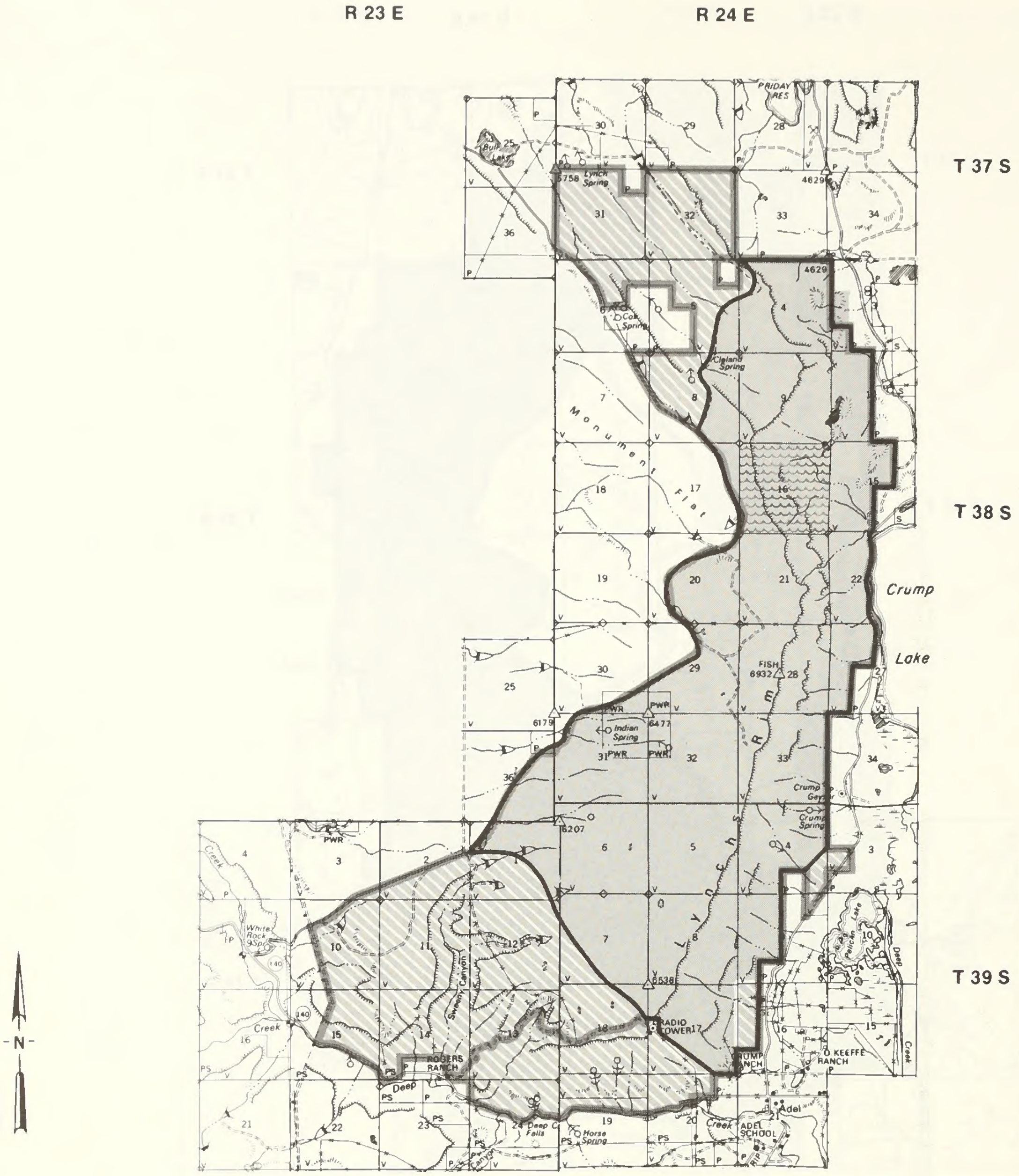
Lakeview District

Fish Creek Rim WSA
OR-1-117

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



▬ **Wilderness Study Area Boundary**

▭ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

〰 Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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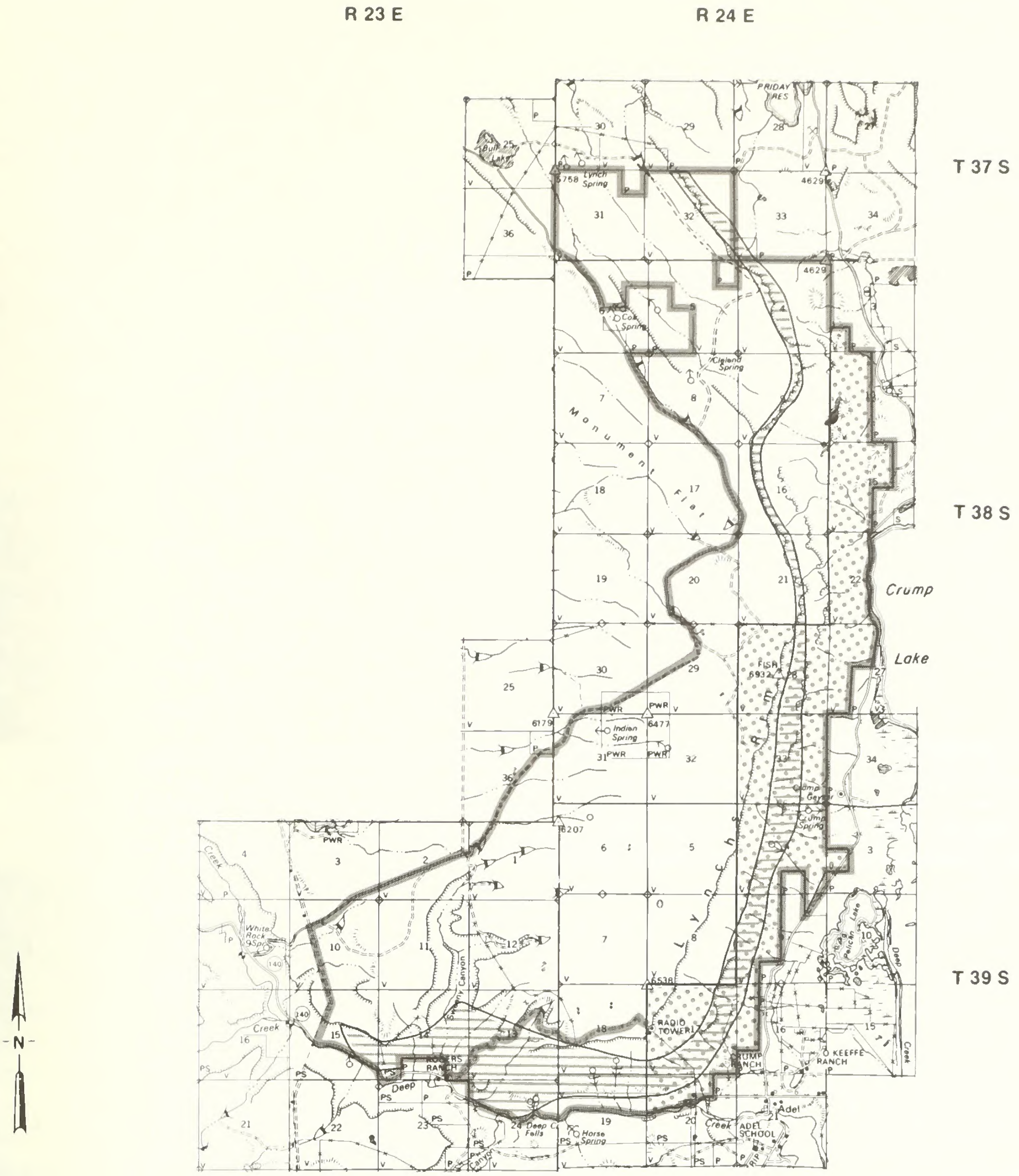
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4



▒ **High Potential (HD) for Geothermal Resources (Also, Portion of WSA within known Geothermal Resource Area)**

☰ **Moderate Potential (MB) for Diatomite**

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MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 5

Fish Creek Rim WSA, OR-1-117. Looking northeast from Fish Creek Rim toward Hart Mountain. Within area recommended suitable under the enhanced and partial (proposed action) alternative. Hiking along the east face and top of the rim offer outstanding scenic vistas such as this. May 1984.

Fish Creek Rim WSA, OR-1-117. Lowsage flats on the south end of the WSA. Within the area recommended suitable under the enhanced and partial (proposed action) alternative. The broad, open areas here ofters outstanding opportunities for solitude. May 1984.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Guano Creek Wilderness Study Area (OR-1-132)

1. Introduction

General Description of Study Area

The Guano Creek Wilderness Study Area (WSA) is located approximately 67 miles northeast of Lakeview, Oregon, in southern Lake County (see Map 1). It is 12 miles from the nearest highway, State Highway 140.

There are 10,350 acres in the WSA, all of it public land (see Map 2). The WSA is roughly rectangular with a small, narrow projection of land along the western edge. The boundaries are defined by low standard dirt or gravel roads with the exception of approximately 1.5 miles along the eastern edge following the boundary of the U.S. Fish and Wildlife Service's Shirk Ranch and an indentation of private land in the north.

The study area is characterized by open and gently rolling terrain which is broken by shallow intermittent drainages, rims and the canyon of Guano Creek. Elevation in the WSA varies from 5,200 feet in Guano Canyon to 5,978 feet on the rim on the east boundary. The WSA contains two ephemeral sink lakes (geologic features created by circular depressions in the lava) in the northern portion and is crossed by three intermittent drainages. The water in Guano Creek is controlled by Jacob's Reservoir, which is located upstream and outside the WSA.

The area is mainly covered with low sagebrush and bunchgrasses with some junipers, big sagebrush, and other shrub species along the rims and drainages. There is a small stand of willow at the lower end of Guano Creek.

Interrelationships

Shirk Ranch, administered by the U.S. Fish and Wildlife Service (USFWS) in conjunction with the Hart Mountain Wildlife Refuge, is adjacent to the WSA on the east. Grazing on approximately 2,000 acres within the WSA is administered by this agency by cooperative agreement with BLM. Water flowing in Guano Creek is regulated by USFWS by means of impoundment at Jacob's Reservoir just upstream of the WSA.

Hart Mountain National Wildlife Refuge, also administered by USFWS, is located 1 mile north of the WSA.

The study area is located within the Oregon Department of Fish and Wildlife's (ODFW) 2,600-square-mile Beatys Butte Wildlife Unit. It supports pronghorn antelope in varying numbers (10 to several hundred depending upon the year). As many as 1,000 antelope (during migration) and approximately 100 mule deer frequent the WSA. ODFW management goals for mule deer are to maintain a summer population of 1,500 adults within the unit as a whole, with a ratio of 12 bucks to 100 does. Sage grouse numbers are high, and one strutting ground has been identified within the WSA. The Sheldon tui chub inhabits Guano Creek. Sage grouse and the Sheldon Tui chub are candidate species for Federal listing under the Endangered Species Act. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

Lake County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on the area's wilderness values,
- impact on mule deer, antelope, sage grouse and tui chub,
- impact on the area's sink lakes,
- impact on energy and mineral development,
- impact on livestock grazing levels,
- impact on recreation use levels, and
- impact on special interest plants.

A potential utility corridor crossing the WSA was considered. As industry analysis has indicated that the corridor could be located to the north or south of the WSA, the issue is not discussed further in this appendix.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness (proposed action)
- partial
- no wilderness/no action

A public comment suggested extending this WSA to the Hart Mountain Wildlife Refuge to the northwest. Alternatives combining this WSA with other inventory units not brought forward in the review process are beyond the scope of this EIS which analyzes suitability and nonsuitability for areas meeting the wilderness inventory criteria.

All Wilderness (Proposed Action)

Under the all wilderness alternative, 10,350 acres of public land would be recommended suitable as wilderness (see Map 2).

Energy and Mineral Development Actions

The all wilderness alternative would close 10,350 acres to all forms of mineral entry. No energy or mineral resources of moderate or high potential are identified in this WSA in either BLM or U.S. Bureau of Mines studies. Based on a low geologic potential for energy or mineral resources, only casual exploration is projected.

Wildlife Habitat Management Actions

Wildlife habitat on the 10,350 acres recommended suitable would be managed to support existing wildlife populations in accordance with ODFW management goals and in a manner consistent with BLM's Wilderness Management Policy. Forage availability to support existing wildlife populations is managed in close coordination with the livestock grazing allotment management plan. No wildlife projects are proposed for the WSA.

Livestock Management Actions

Livestock use in the WSA would remain at current level of 575 AUMs in the WSA. The season of use would remain as identified in Table 4. USFWS administers the grazing use on approximately 2,000 acres at the mouth of Guano Canyon during the winter months. Livestock management such as salting and checking livestock would be accomplished by horseback. Once every 5 to 10 years heavy equipment would be used for maintenance of three existing reservoirs. Maintenance of 1.5 miles of fence in the WSA would be conducted by horseback.

Recreation Management Actions

Under the all wilderness alternative, 10,350 acres and 5 miles of ways would be closed to vehicles. Current recreation use is estimated to be less than 100 visitor days per year.

Partial

The partial alternative would recommend 9,890 acres of public land suitable as wilderness (see Map 3). It would recommend as nonsuitable 460 acres which protrude from the western edge of the WSA along and south of Guano Creek to allow relocation of one mile of road along Guano Creek for improvement of general access. This would require construction of one ford across Guano Creek. The boundary between the suitable and nonsuitable portions would follow a section line.

Energy and Mineral Development Actions

This alternative would close 9,890 acres to mineral entry. Based on the low potential for mineral development, only casual exploration is projected. The 460 acres recommended nonsuitable would remain open to mineral entry. No exploration or development is projected for the 460 acres open to mineral entry.

Wildlife Habitat Management Actions

Wildlife habitat would be managed on 9,890 acres designated wilderness to support ODFW goals and BLM Wilderness Management Policy objectives as described in the all wilderness alternative. Forage availability to support existing wildlife populations is managed in coordination with the livestock grazing allotment management plan. The Wilderness Management Policy would not constrain management on the 460 acres designated nonsuitable. No wildlife projects are planned for either suitable or nonsuitable acreages.

Livestock Management Actions

Current livestock grazing use would remain at 575 AUMs within the WSA. Vehicle use would be restricted on the 5 miles of ways within the portion recommended suitable. Once every 5 to 10 years, heavy equipment would be used for maintenance of 3 existing reservoirs. Maintenance of 1.5 miles of fence and other livestock management actions in the WSA would be conducted by horseback. There would be no restrictions on vehicle access to the 460 acres recommended nonsuitable.

Recreation Management Actions

The 9,890 acres recommended suitable under this alternative would be closed to vehicle traffic, including 5 miles of ways within the WSA. The 460 acres recommended nonsuitable would remain open to vehicle access. Current recreational use is estimated to be less than 100 visitor days per year.

No Wilderness/No Action

The No Wilderness/No Action alternative would recommend the entire WSA nonsuitable as wilderness, and wilderness values would not receive special legislative protection. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Action

The entire 10,350 acres would be open to energy and mineral entry. Based on BLM and U.S. Bureau of Mines surveys there is no moderate or high energy or mineral potential within this WSA. As of October 16, 1987, there were no energy leases or mining claims in the WSA. Only casual surface exploration would be likely to occur.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to support game and nongame species in present condition and numbers, in accordance with ODFW management goals. Forage availability to support existing wildlife populations is managed in coordination with the livestock grazing allotment management plan. No wildlife projects are proposed.

Livestock Management Actions

Livestock grazing levels would remain at approximately 575 AUMs. Season of use would remain as described in Table 4. Two additional water developments to benefit livestock would be realized within the WSA: one waterhole in the largest sink lake, and a reservoir in the Clover Swale drainage. The entire study area would be open to vehicle access for salting and checking of livestock, and for the maintenance of reservoirs and waterholes and 1.5 miles of fence.

Recreation Management Actions

The entire WSA would be open to vehicle access. Most vehicle use in the area is limited to the boundary roads and the 5 miles of ways. Current recreational use is less than 100 visitor days per year.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Guano Creek WSA is in a natural condition. The area is characterized by undisturbed uplands and rims with two unaltered sink lakes. Guano Canyon receives intense livestock use every other year, during which time riparian vegetation is altered from natural condition. The presence of native plant communities and rare plant and animal species does indicate significant natural values are present.

There are few unnatural features in the WSA. They are small and visible only from the immediate area. These features include 5 miles of ways which occur mainly along the drainages and are apparent only when viewed from along their routes. There are three very small reservoirs and 1.5 miles of fence in the WSA. The reservoirs are scattered and not noticeable for any distance. About 1 percent of the WSA is influenced by these developments.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The opportunities for solitude exist throughout the WSA. Visitors will find it especially easy to isolate themselves in the canyon and along the rimrock where landform and juniper offer ample screening. The sink lakes, bowl-like depressions in the basalt uplands, offer isolation in spite of the low vegetation. The remoteness of the WSA elicits a feeling of solitude even on the open sage flats.

Opportunities for primitive and unconfined types of recreation are outstanding in the WSA. Day hiking, wildlife observation, photography, horseback riding and antelope hunting are all good in the WSA. Day hiking can vary from flat, easy terrain on top to steep, rugged terrain in the canyon and rims.

Special Features

The two ephemeral sink lakes in the northern portion of the WSA are geological features which are unique to the basalt flows of southeastern Oregon. The significance of these two lakes is that they are undisturbed by water projects (few such unaltered lakes remain). These sink lakes have been surveyed by the Pacific Northwest Research Natural Area Committee as a potential Research Natural Area (RNA), but more inventory is needed before a recommendation is made on their eligibility for RNA status.

Tertiary tuffaceous sedimentary rocks along the eastern portion of the WSA contain late Miocene vertebrate fossils.

Guano Creek is the habitat of the Sheldon tui chub, a candidate species in Oregon for addition to the list of Federal threatened and endangered species. Its range is limited to a few springs and streams of northwest Nevada and southeast Oregon.

Another candidate species for Federal threatened and endangered status which inhabits the WSA is the sage grouse. Wintering concentrations are high, and there is at least one strutting ground within the WSA.

Two plant species of special interest, *Eriogonum crosbyae* (Crosby's buckwheat) and *Ivesia sp. nov.* are also found in the WSA. The Vegetation section further discusses these plants.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler System of classifying ecosystems, the Guano Creek WSA is located in the Intermountain Sagebrush Province with a potential natural vegetation of sagebrush steppe. Vegetative communities listed in the Basin and Range section of the Oregon Natural Heritage Plan which occur in the WSA are low sagebrush/Sandberg's bluegrass, silver sagebrush, and big sagebrush/bluebunch wheatgrass.

Guano Creek WSA is located within 5 hours' driving time of four standard metropolitan statistical areas with populations over 100,000: Reno, Nevada; Boise, Idaho; Eugene/Springfield, Oregon; and Redding, California.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and data provided in a report by TERRADATA, a consulting firm under contract with BLM. The report is titled "Assessment of Geology, Energy, and Minerals Resources of the Crump Lake Geologic Resource Area." The WSA is within the Crump Lake Geologic Resource Area which has been classified according to a rating system that indicates both the potential for occurrence (geologic potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Recent studies conducted by the U.S. Bureau of Mines and U.S. Geological Survey have been incorporated with BLM assessments to modify evaluations projected in the Draft EIS. As a result there are no moderate or high energy or mineral potential identified in the WSA.

The surface rocks of the WSA are mostly Tertiary andesitic and basaltic flows and tuffaceous sedimentary rocks. Little is known of the subsurface geology but pre-Tertiary marine sedimentary rocks may exist at depth.

Energy Resources

There is no evidence, direct or indirect, that the Guano Creek WSA has moderate or high potential for oil and gas or geothermal resources. As of October 16, 1987, there were no energy leases within the WSA.

Mineral Resources

The TERRADATA report rated the potential for mercury, gold, silver and diatomite as moderate, based on indirect evidence. Data from the U.S. Bureau of Mines and U.S. Geological Survey indicate that mineral potential within the WSA, including potential for mercury, gold, silver and diatomite, is low and no exploration other than casual is expected. As of October 16, 1987, there were no mining claims in the WSA.

Vegetation

A majority of the WSA consists of uplands supporting a low sagebrush/Sandberg's bluegrass community. Guano Creek Canyon and many of the rims and drainages contain big sagebrush, squaw currant, chokecherry, western juniper, mountain mahogany, aspen, Thurber's needlegrass, bluebunch wheatgrass, squirreltail, and Great Basin wildrye. The two sink lakes support common spike-rush, leafy arnica, poverty weed, mat muhly grass, and silver sagebrush. The creekside vegetation consists of bluegrasses, Junegrass, willows, silver sagebrush, rushes, and sedges. Riparian species are heavily used along Guano Creek by livestock. General condition is poor to fair in these riparian areas. More recent grazing practices on the east side of the WSA are intended to improve riparian condition from fair to good by control of winter and spring use by livestock. The upper 3 miles of the creek will remain under grazing pressure and remain in low to mid-seral stage. The ecological status of vegetative communities in the upland portions of the WSA, due to the limitations of soils in the area, are at near potential natural climax.

A population of *Eriogonum crosbyae* (Crosby's buckwheat) occurs on the east side of the WSA. The site is unique in soil and vegetative composition, with this species showing considerable variability. The species is known to exist in only two other locations in Oregon and is a candidate for Federal listing under the Endangered Species Act.

Ivesia sp. nov. occurs in the Guano Creek WSA and is known from only one other area, also on the Lakeview District. This recently discovered species is on List 1 of the Oregon Natural Heritage Data Base, taxa endangered throughout range.

Wildlife

The WSA receives summer antelope use, with resident numbers of animals ranging from about 10 to several hundred. It is estimated that 1,000 antelope use or pass through the area each year. Herd condition is good.

Approximately 100 mule deer use or frequent the study area on a year-round basis. They tend to concentrate near the rimrocks where junipers provide cover. Herd condition is fair to good.

The Sheldon tui chub, a candidate species for Federal threatened and endangered status, inhabits Guano Creek. Potential threats to the species include overall streamside degradation due to livestock grazing.

The entire WSA is habitat for sage grouse, a candidate species for Federal threatened and endangered status. One strutting ground has been identified within the study area. Potential threats to this species include loss of sagebrush cover.

Waterfowl including gadwall, pintail, shoveler, mallard, and Canada geese nest among the emergent vegetation of the two sink lakes and Guano Creek during wet years, producing as many as 25 broods of 6 to 10 ducklings (or goslings). These same areas provide resting and feeding habitat for these and other migrating birds each spring. The rims and canyons are likely habitats for raptors, but no nests have been observed. The WSA is also habitat for coyote, skunk, badger, porcupine, weasel, Stellar's jay, nighthawk, swift, flycatcher, numerous other birds, small mammals and amphibians. Western rattlesnake, gopher snake, fence lizard and other reptiles are also present.

Watershed

Guano Creek is a perennial stream flowing southeast from Hart Mountain. Jacob's Reservoir, outside of the study area, impounds water for livestock use; the flow of water through the WSA fluctuates due to USFWS regulation of the water level in the reservoir. The water quality and riparian condition of Guano Creek varies from good in the early spring when snowmelt flushes through, and before cattle are brought into the area, to poor when water is impounded in the reservoir and livestock are introduced. When stream flow drops and leaves standing pools, cattle concentrate at these pools grazing and causing trampling. The resulting widening of the streambed results in higher water temperatures when flow is restored.

Livestock Grazing

Grazing in the Guano Creek WSA is administered by BLM on 8,350 acres which are a part of the Beatys Butte allotment. Grazing on approximately 2,000 acres at the mouth of Guano Canyon is administered by USFWS under a cooperative agreement with BLM. Current use within the WSA is 575 AUMs. Table 4 shows existing livestock numbers and season of use.

Existing livestock developments are three reservoirs and 1.5 miles of fence. Five miles of vehicle ways within the WSA are used by grazing operators three or more times per year as necessary for livestock inspection and salting. The three reservoirs are maintained by heavy equipment once every 5 to 10 years. Livestock gathering and minor fence repairs are performed by horseback.

Recreation Use

Recreation in the study area consists mainly of hunting, hiking, sightseeing and nature study. Deer, antelope, and upland game bird hunting are the activities most associated with vehicle use in the WSA. The total recreation use in the WSA is estimated to be less than 100 visitor days per year.

Local Personal Income

Livestock use at the current level of 575 AUMs and recreation use totaling less than 100 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $7,000 for livestock grazing and more than $1,000 related to recreation use of the WSA, for a total of $8,000. The statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in this WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 10,350 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The all wilderness alternative would add 10,350 acres to the National Wilderness Preservation System (NWPS) and preserve, by legislative mandate, the wilderness qualities of naturalness, solitude and opportunities for primitive recreation, as well as the special features such as the sink lakes, paleontological resources, habitat for sage grouse and the Sheldon tui chub, *Eriogonum crosbyae* and *Ivesia sp. nov.*

Naturalness

The natural qualities of the Guano Creek WSA evidenced by the undeveloped sink lakes, the unique native plant communities and the valuable riparian habitat occupied by the Sheldon tui chub, would be preserved and enhanced under this alternative. Closure of the study area to vehicles would enhance naturalness by allowing for the revegetation of approximately 5 acres on the 5 miles of ways within the study area. Revegetation of these ways would visually enhance naturalness on 130 acres.

Solitude

Opportunities for solitude provided by the area's remoteness, its central canyon and miles of rimrock would be enhanced by the elimination of vehicles on 5 miles of ways which have short-term impacts on approximately 130 acres.

Primitive and Unconfined Recreation

The all wilderness alternative would preserve and enhance opportunities for primitive recreation by eliminating conflicts with vehicle-oriented recreation within the WSA. Hunting, backpacking, camping and other primitive activities would benefit esthetically and physically within the WSA due to an enhanced sense of isolation within a primitive setting.

Special Features

Under this alternative, the sink lakes would remain in a natural condition, thus preserving undisturbed two examples of this geologic feature. Species of special interest; Crosby's buckwheat, *Ivesia,* Sheldon tui chub and sage grouse, would benefit from the additional habitat protection offered under designation by closing 5 miles of ways and eliminating off-road vehicle travel.

Conclusion: Wilderness designation of the entire Guano Creek WSA would preserve and enhance the existing wilderness values on its 10,350 acres.

Impacts on Energy and Mineral Development

All 10,350 acres of the Guano Creek WSA would be closed to mineral entry. No moderate or high potential is identified for either energy or mineral resources in the WSA. No development potential is identified.

Conclusion: No impact to energy or mineral development is expected.

Impacts on Vegetation

Vegetative composition and ecological status as described in the vegetation section in the Affected Environment would not change. The exclusion of vehicles from the WSA would help preserve existing natural vegetative communities, Crosby's buckwheat and the *Ivesia* population would be preserved. Continuation of present livestock use along the upper 3 miles of Guano Creek will keep riparian vegetation in the low to mid-seral stage of succession. The 5 miles of ways, once closed to vehicles, would revegetate in 5 to 8 years.

Conclusion: Closure of ways would allow approximately 5 acres to revegetate. No substantial change in vegetation would occur.

Impacts on Wildlife

Habitat for approximately 100 mule deer, 1,000 antelope, Sheldon tui chub populations and sage grouse would be maintained under wilderness designation. Adequate wildlife forage would be ensured by proper livestock allotment management. Preservation of the sink lakes in natural condition would continue to provide habitat for Canada geese, mallards, gadwall and other waterfowl. The closure of 5 miles of ways would reduce minor disturbances to these wildlife species by vehicles.

Conclusion: Wildlife habitat and population levels would be preserved on 10,350 acres.

Impacts on Watershed

With continued impoundment of water upstream of the WSA and continuation of present livestock use on the riparian zone, no change in water quality in the Guano Creek watershed would occur.

Conclusion: No changes in water quality are foreseen under this alternative.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 575 AUMs. Vehicle access on 5 miles of ways for livestock management activities would be excluded. Livestock management activities would be accomplished using horses or pack stock. Reservoir maintenance would be accomplished by the use of heavy equipment once every 5 to 10 years. Existing ways would be used for access to two of the reservoirs; the third reservoir is adjacent to the north boundary road.

Construction of one reservoir and one waterhole would be precluded, the opportunity to increase water availability would be foregone.

Conclusion: Livestock use would remain at the current use level of 575 AUMs. Opportunity to increase water available for livestock would be foregone. Constraints on vehicle use would cause a minor inconvenience and increase in cost to livestock operators.

Impacts on Recreation Use

Primitive recreation opportunities associated with hiking, photography, nature study, sightseeing, horseback riding and camping would be preserved in the WSA under the all wilderness alternative. Hunters dependent on vehicles would be inconvenienced by the closure of 5 miles of ways within the study area. Some vehicle-oriented recreation use would change to primitive use. Total recreation use would remain at lees than 100 visitor days per year.

Conclusion: No significant change in visitor use of less than 100 visitor days per year is expected.

Impacts on Local Personal Income

Livestock grazing would remain at 575 AUMs, and overall recreation use would remain at approximately 100 visitor days per year. Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $8,000.

Partial

Recommended suitable for wilderness: 9,890 acres
Recommended nonsuitable for wilderness: 460 acres

Impacts on Wilderness Values

The partial alternative would add 9,890 acres to the NWPS. Wilderness values on this portion of the study area would be preserved by legislative mandate. Opportunities for solitude and for primitive and unconfined recreation, naturalness, and the special features of the sink lakes, paleontological resources, sage grouse and tui chub habitat and *Eriogonum* and *Ivesia* sites would be preserved.

Wilderness values on the 460 acres not recommended suitable under this alternative, including one mile of Guano Creek, would not receive legislative protection. Boundary road realignment would physically impact approximately 80 acres along Guano Creek, south of Jacob's reservoir. This action is addressed in the description of the partial alternative as a general, rather than, program-specific action.

Naturalness

Under the partial alternative, naturalness on the 9,890 acres recommended suitable would be preserved. Closure of 5 miles of ways within the study area would directly enhance naturalness on 5 acres revegetated over a period of 5 to 8 years with visual enhancement on approximately 130 acres.

Road realignment along 1 mile of Guano Creek would alter one acre of surface affecting natural conditions on approximately 80 acres of the 460 acres recommended nonsuitable.

Solitude

Opportunities for solitude within the area recommended suitable would be preserved and enhanced by elimination of motorized vehicle traffic. This would result in the elimination of short-term disturbance on approximately 130 acres.

No actions are proposed which would affect solitude on the 460 acres recommended nonsuitable as road realignment would remain in the same drainage presently occupied by the boundary road.

Primitive and Unconfined Recreation

Opportunities for such primitive recreation activities as hiking, camping, backpacking, horseback riding, hunting, photography and nature study would be preserved and enhanced on 9,890 acres. The closure of 5 miles of ways would enhance all of these opportunities by improving the primitive natural setting.

The 460 acres recommended nonsuitable would remain available for road realignment along Guano Creek which would provide improved access opportunities for primitive recreation as well as nonprimitive recreation. Primitive values, during and after road construction, would diminish along 1 mile of Guano Creek.

Special Features

Special features related to *Eriogonum* and *Ivesia,* tui chub and sage grouse habitat and the sink lakes would receive wilderness legislative protection under the partial alternative.

Sage grouse habitat in the 460 acre nonsuitable portion would be subject to minor impacts from road realignment, causing less than one acre of disturbance. Stream habitat could be stabilized by improved road alignment and a stable fording location.

Conclusion: Wilderness values would be preserved and enhanced on 9,890 acres. One acre of disturbance would occur in the nonsuitable portion, with further declines from other potential uses over the long term.

Impacts on Mineral and Energy Development

The 9,890 acres recommended suitable would be closed to mineral entry. As no moderate or high energy or mineral resources are identified in the WSA, only casual exploration is projected with no development. No moderate or high energy or mineral potential exists in the 460 acres recommended nonsuitable. Casual exploration could occur; no development is expected.

Conclusion: No impact to energy or mineral development is expected.

Impacts on Vegetation

On the 9,890 acres recommended suitable, the impacts on vegetation would be identical to those covered in the all wilderness alternative. No change is anticipated other than revegetation on 5 acres due to closure of 5 miles of ways.

Road relocation would destroy vegetation on approximately one acre of the 460 acres found nonsuitable.

Conclusion: One acre of vegetation would be lost.

Impacts on Wildlife

Habitat for sage grouse, antelope, mule deer and all other terrestrial species would be preserved on the 9,890 acres recommended suitable. The impact of the closure of 5 miles of ways would be most evident during hunting seasons because game would not be scattered by the movement of vehicles along these ways. Adequate wildlife forage would be ensured in coordination with livestock allotment management. The condition of tui chub habitat would not change under this alternative.

Road realignment would have short-term disturbance of terrestrial habitat and stream habitat within the 460 acres recommended nonsuitable.

Conclusion: The partial alternative would preserve existing wildlife habitat on 9,890 acres. There would be short-term disturbance on one acre of terrestrial habitat and stream habitat.

Impacts on Watershed

Impacts on watershed would be the same as under the all wilderness alternative for the 9,890 acres recommended suitable under this alternative.

Minor short-term disturbance of the stream would occur with road realignment and placement of a new ford. There would be no substantial long-term effect on stream quality.

Conclusion: Water quality in the watershed would not change from present fluctuating conditions.

Impacts on Livestock Grazing

Livestock use would continue at current levels of 575 AUMs. Five miles of ways within the suitable portion would be closed to vehicles. Excluding vehicle access for livestock management on 5 miles of ways would cause inconvenience to the operator. Two additional water facilities, a waterhole in a sink lake and a reservoir in Clover Swale, would be foregone. Three existing reservoirs would be maintained using heavy equipment once every 5 to 10 years.

Conclusion: Grazing use level would remain at 575 AUMs. Enhancement of water availability for livestock would be foregone.

Impacts on Recreation Use

Recreation use within the 9,890 acres recommended suitable would be expected to shift from vehicle-oriented to primitive use. A slight decline in vehicle-oriented hunting would result from the closure of the 5 miles of ways. A slight increase in visitors engaging in such primitive recreation pursuits as backpacking, hiking, photography and nature study would offset the decrease in nonprimitive use. Recreation use would remain at less than 100 visitor days per year.

Conclusion: Recreation use of the WSA would remain at the current level of less than 100 visitor days per year with a shift from vehicle-oriented recreation to primitive recreation.

Impacts on Local Personal Income

Livestock grazing would remain at 575 AUMs, and overall recreation use would remain at approximately 100 visitor days per year. Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $8,000.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 10,350 acres

Impacts on Wilderness Values

Under this alternative the entire 10,350 acres of the Guano Creek WSA would not be designated wilderness and wilderness values would not receive legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and the area's special features, including habitat for sage grouse and the Sheldon tui chub, paleontological resources, *Eriogonum crosbyae* and *Ivesia sp. nov*, and the sink lakes would be subject to continuing and projected management actions. These actions include continued vehicle access for livestock management and recreation, construction of one reservoir and one waterhole, and road realignment.

Naturalness

The natural values of the WSA would be impacted by the construction of a waterhole in the larger sink lake and a reservoir in Clover Swale.

The waterhole proposed in the larger of the sink lakes would lower the water table and concentrate livestock use in and around the lakebed. The resulting loss of soil moisture, compaction of soils and heavy utilization of forage would greatly alter the natural appearance of the lake. Berms around the waterhole would contrast with the natural visual aspect of the sink lake. Total disturbance would impact 2 acres directly, with an additional 250 acres affected by ongoing grazing pressure. The visual impact would affect approximately 1,000 acres within the study area.

The proposed reservoir would result in alteration of a natural stream drainage as well as leading to the compaction of soils and the removal of forage in the immediate vicinity. Reservoir construction would affect approximately 2 acres directly. Ongoing impacts from the concentration of livestock would affect approximately 10 additional acres, while the visual impacts would affect approximately 300 acres.

Five miles of ways would remain open to vehicles, maintaining their impact as unnatural features visible from approximately 130 acres of the WSA. Road realignment along 1 mile of Guano Creek would alter 1 acre of surface, affecting naturalness on about 80 acres.

Solitude

Opportunities for solitude within the WSA would be locally diminished in the short term during the construction of livestock projects. Continued vehicle use on 5 miles of ways would impact solitude on approximately 130 acres. Road realignment would cause short-term disturbance of solitude during construction.

Primitive and Unconfined Recreation

The continued access to the interior of the WSA by motor vehicles on ways and cross-country would maintain physical and esthetic impacts upon primitive recreation opportunities due to the persistence of trails and the presence of noise from vehicles over about 130 acres. The construction of a waterhole in the larger sink lakebed would reduce opportunities for nature study, birdwatching and photography by reducing the scenic qualities and waterfowl habitat.

Special Features

The large sink lake in the study area would be developed and altered. Sage grouse habitat, paleontological sites and the populations of *Eriogonum crosbyae* and *Ivesia sp. nov.* would be subject to physical disturbance by possible off-road vehicle use.

Conclusion: In the absence of wilderness designation, projected and continued activities with an extended cumulative effect would impair wilderness values over approximately 1,430 acres.

Impacts on Energy and Mineral Development

The entire 10,350 acres would remain open to mineral entry. No energy or mineral development is projected as no moderate to high potential exist. Casual exploration for minerals would be projected.

Conclusion: There would be no impact on energy or mineral development.

Impacts on Vegetation

Native vegetation would be altered under this alternative by waterhole construction in the larger sink lake where existing natural communities would be removed along with the soil during the construction phase. The resulting lowering of the water table would alter lakebed and shoreline vegetation from species dependent on the presence of water in the ephemeral lake to less moisture-dependent species. Natural vegetation would be reduced to increased grazing and trampling on approximately 250 acres by livestock congregating around the waterhole.

Reservoir construction would remove approximately 2 acres of vegetation during construction and an additional 10 acres would be subject to heavy grazing due to the increased concentration of livestock around the active reservoir and/or a reduction in riparian species below the impoundment.

Continued vehicle use on 5 miles of ways would prevent the reestablishment of vegetation on 5 acres along these tracks. In the absence of vehicle controls, cross-country use and creation of new ways would result from continued use. Road realignment would remove vegetation on approximately 1 acre.

Conclusion: Vegetation density and species composition would be permanently altered on approximately 260 acres.

Impacts on Wildlife

Significant impacts to wildlife would result from the construction of a waterhole in the larger of the sink lakes. A waterhole in the lakebed would lower the lake level and would concentrate livestock in the area, both of which would lead to the elimination of nesting habitat for waterfowl.

Reservoir construction in Clover Swale would benefit deer and antelope by holding water for a longer period after spring runoff, but at the same time would reduce cover habitat for nongame species and sage grouse by creating a livestock concentration area and removing vegetation. The resulting grazing and trampling would reduce forage and cover for wildlife.

Conclusion: A no wilderness action would reduce the waterfowl production of the WSA by 85 to 90 percent, and would reduce forage and cover for sage grouse and nongame species, while benefiting deer and antelope by increasing available water.

Impacts on Watershed

Reservoir construction in Clover Swale would concentrate livestock, resulting in reduced water quality and stream flows due to accumulation of livestock waste and compaction of soils, removal of vegetation and raised water temperatures. The reservoir in this ephemeral drainage would block flows after peak spring runoff from the last 2 miles of its course. A lakebed pit in the sink lake would lower the water table in the 250-acre lake.

Conclusion: Water quality and flow would be reduced on approximately 2 miles of ephemeral stream. The water table would be lowered in the 250-acre sink lake.

Impacts on Livestock Grazing

Livestock grazing would remain at the current use level of approximately 575 AUMs. An additional reservoir and waterhole are proposed in the WSA to improve water availability for livestock. The proposed reservoir would be constructed at the south end of Clover Swale. The proposed waterhole would be in the larger sink lake in the north portion of the WSA. Five miles of vehicle ways would remain open to livestock management activities.

Conclusion: Livestock use would remain at 575 AUMs. Two water projects to benefit livestock would be constructed.

Impacts on Recreation Use

Five miles of ways within the study area would remain open to vehicle-oriented recreation use. This type of recreation, primarily associated with big game and upland game bird hunting, accounts for the majority of recreational activity in the WSA. Opportunities for primitive and unconfined recreation would be reduced under this alternative by continued vehicle access into the area and by livestock projects which would reduce opportunities for wildlife observation, nature study and enjoyment of the area's scenic qualities.

Conclusion: Recreation use would remain at current use levels of less than 100 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 575 AUMs, and overall recreation use would remain at approximately 100 visitor days per year. Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $8,000.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (all wilderness) construction of two water projects to provide additional water for livestock would be foregone. Vehicle use on 5 miles of ways would be excluded, resulting in a minor inconvenience to the livestock operator and reducing the opportunities for those who prefer this type of recreation.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, most existing short-term uses would continue, with some minor inconvenience to the livestock operator resulting from the exclusion of vehicles for livestock management. Hunting use would continue without vehicle access. The long term productivity of the wilderness values would be preserved.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area is capable of being managed to preserve its wilderness characteristics.

Rationale for the Selection of the Proposed Action

The all wilderness alternative is the Proposed Action because the benefits of preserving the area's wilderness values. Benefits include maintaining the sink lakes in a natural condition for waterfowl habitat as well as the educational, scientific and esthetic values they represent, sage grouse habitat, protection of *Eriogonum crosbyae* and *Ivesia sp. nov.* habitat and protection of riparian habitat in Guano Creek. These benefits would outweigh the benefits of maintaining options for casual exploration for mineral resources, continued vehicle use on 5 miles of ways and two water developments for enhancement of water availability for livestock.

The selection of the all wilderness alternative, over the partial alternative described in the Draft EIS was founded on the ability to relocate the boundary road outside the WSA without the need to reduce the acreage suitable for wilderness designation. This would retain the ability to use the road as a boundary, thus improving manageability.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: The chub inhabiting Guano Creek is not addressed. **Response:** This information was not available at the time of the Draft EIS. Pertinent information on the Sheldon tui chub has been added to the Wildlife and Special Features sections of this appendix.

Comment: The WSA should be extended to the northwest to connect with the Hart Mountain National Wildlife Refuge. **Response:** The present boundary separating the WSA from the roadless area between it and the refuge is a road. See discussion of issues considered but not analyzed under scoping, section I.

Comment: A proposed powerline corridor would impact the area, making it unsuitable as wilderness. **Response:** This proposed corridor is likely to be located outside the WSA, and therefore, its environmental impact was not a subject of the decision process.

Table 1. Summary of Proposed Management Under Each Alternative, Guano Creek WSA (OR-1-132)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	10,350	9,890	0
Acres Closed to ORVs by Wilderness Designation	10,350	9,890	0
Miles of Ways Closed	5	5	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	10,350	9,890	0
Structural Livestock Projects Developed: Reservoirs & Waterholes (number)	0	0	2

Table 2. Summary of Environmental Consequences of Alternatives, Guano Creek WSA (OR-1-132)

Resource or Activity	All Wilderness (Proposed Action)	Partial	No Wilderness/ No Action
Wilderness Values	Wilderness designation of 10,350 acres would result in protection and enhancement of existing wilderness values.	Wilderness designation of 9,890 acres would protect and enhance existing wilderness values. One acre of the nonsuitable portion would be affected by projected actions.	Projected management activities would impair the area's naturalness, solitude and recreation opportunities and special features on 1,430 acres.
Energy and Mineral Development	No impact to energy or mineral development.	No impact to energy or mineral development.	No impact to energy or mineral development.
Vegetation	Little or no change to vegetation throughout.	Little or no change in suitable area. One acre altered for road realignment.	Vegetation altered over 260 acres by waterhole and reservoir construction and by road realignment.
Wildlife	Habitat and populations would be maintained throughout the area.	Habitat and populations would be maintained in the suitable portion. One acre of habitat would be altered by road realignment.	Waterhole construction in sink lake would reduce waterfowl production by 85 to 90 percent. Concentration of cattle at new water facilities would reduce nesting and escape cover. Road realignment would alter one additional acre.
Watershed	Water quality would remain in present condition throughout.	Water quality would remain in present condition in suitable portion. Short-term impact to water quality and flow during road realignment.	Water quality and flow reduced on 2 miles of ephemeral stream. Water table lowered in 250-acre sink lake.
Livestock Grazing	Vehicle use on 5 miles of ways would be limited, resulting in minor inconvenience to livestock operator. Enhancement of water availability for livestock foregone.	Vehicle use on 5 miles of ways would be limited, resulting in minor inconvenience to livestock operator. Enchancement water availability for livestock foregone.	Two water facilities would be constructed.
Recreation Use	Overall recreation use level not affected. There would be a change to nonmotorized types of recreation use.	Overall recreation use level not affected. There would be a change to nonmotorized types of recreation use.	No change in use level or type
Local Personal Income	Local personal income would remain at $8,000 per year.	Local personal income would remain at $8,000 per year.	Local personal income would remain at $8,000 per year

Table 3. Classification of Energy and Mineral Potential, Guano Creek WSA (OR-1-132)

Commodity	Area	Level of Potential	Level of Certainty
Metals (gold, silver, mercury)	Entire WSA	L	C
Geothermal	Entire WSA	L	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestome	Entire WSA	0	C
Bentonite	Entire WSA	0	A
Diatomite	See Map 4	L	C
	Rest of WSA	0	B
Zeolites	Entire WSA	L	B

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

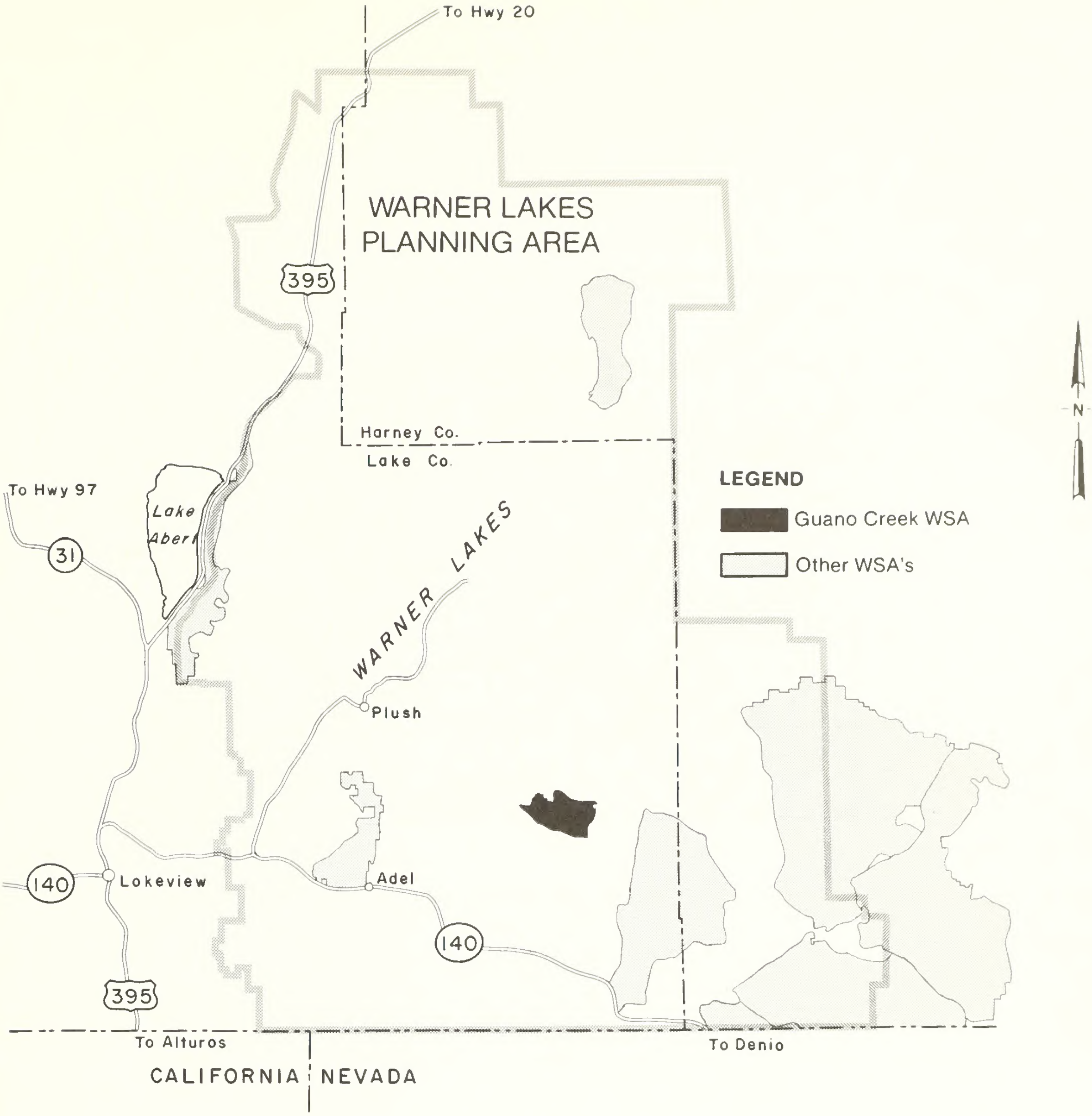
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

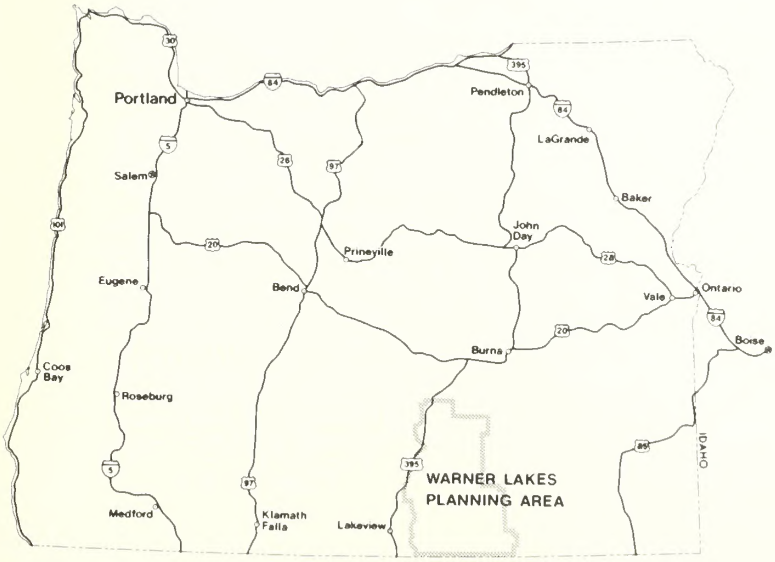
Table 4. Existing Livestock Use, Guano Creek WSA (OR-1-132)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Estimated Use in WSA (AUMs)
Beatys Butte (No. 0600)	26,121	04/1-12/15	2	575

Table 5. Effects of Alternatives on Local Personal Income, Guano Creek WSA (OR-1-132) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No Change	No Change	No Change
Recreation Use	RVD	No Change	No Change	No Change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	0	0	0
Recreation Use	$	0	0	0
Total	$	0	0	0





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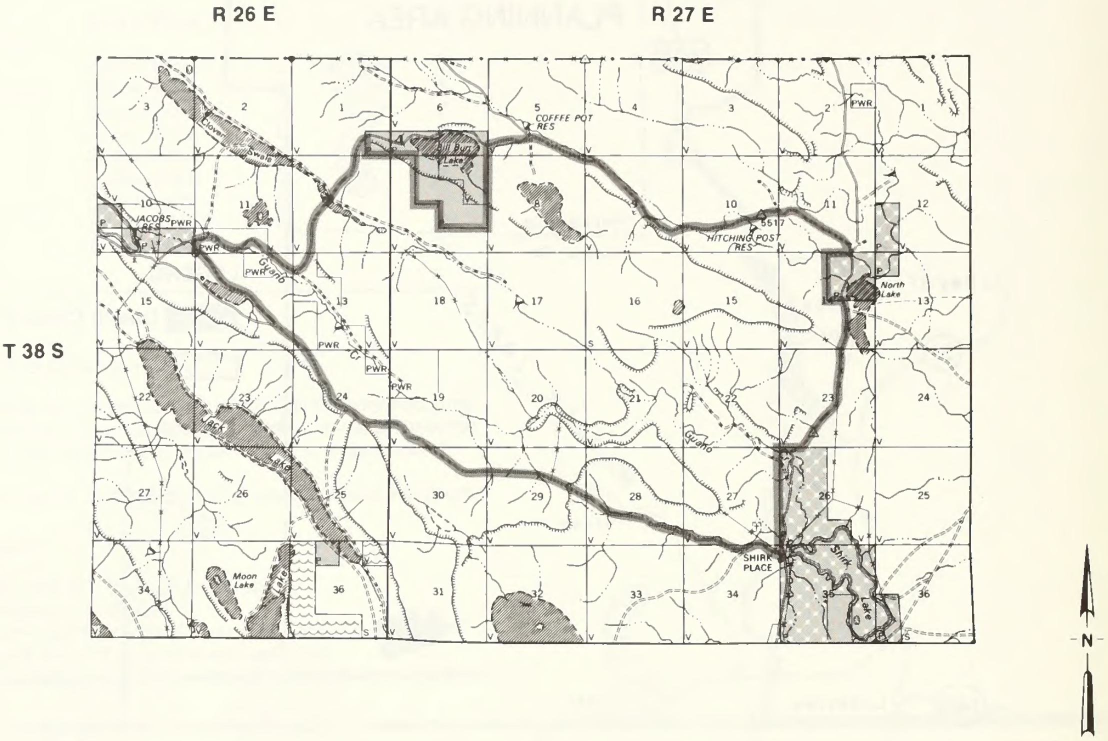
Lakeview District

Guano Creek WSA
OR-1-132

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▢ BLM Land in WSA Studied Under Section 603 of FLPMA

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▩ Private

▒ U.S. Fish and Wildlife Service

≋ BLM Surface-State or Private Subsurface (Split Estate)

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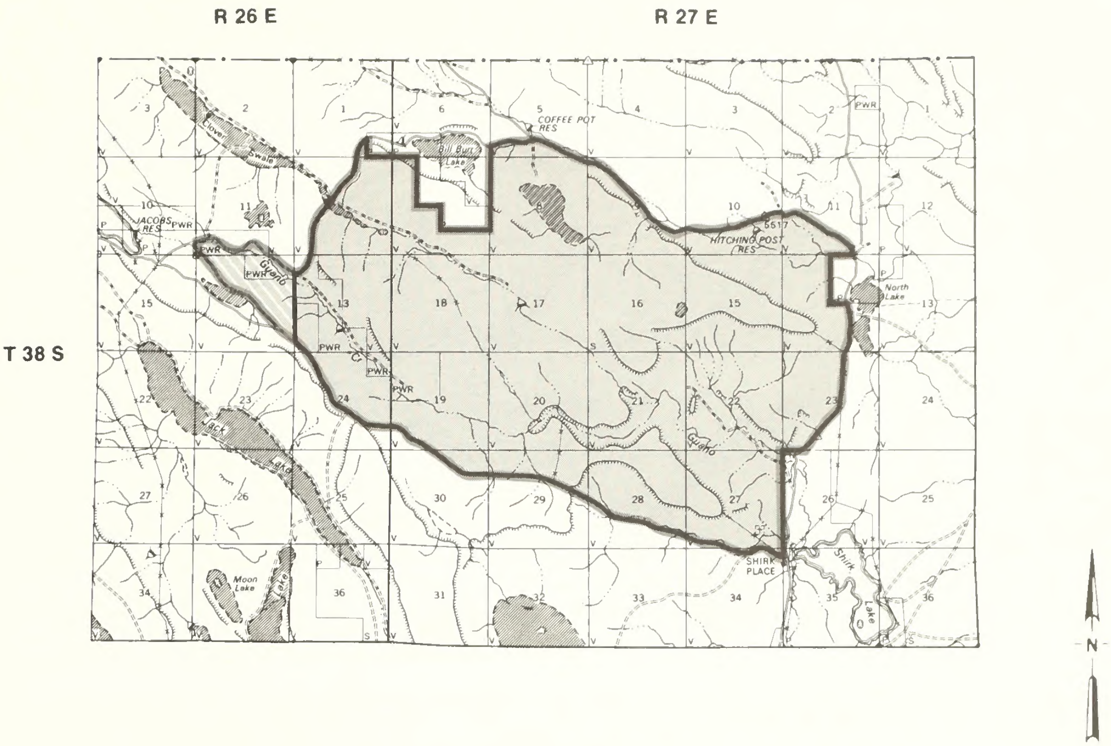
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

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Guano Creek WSA
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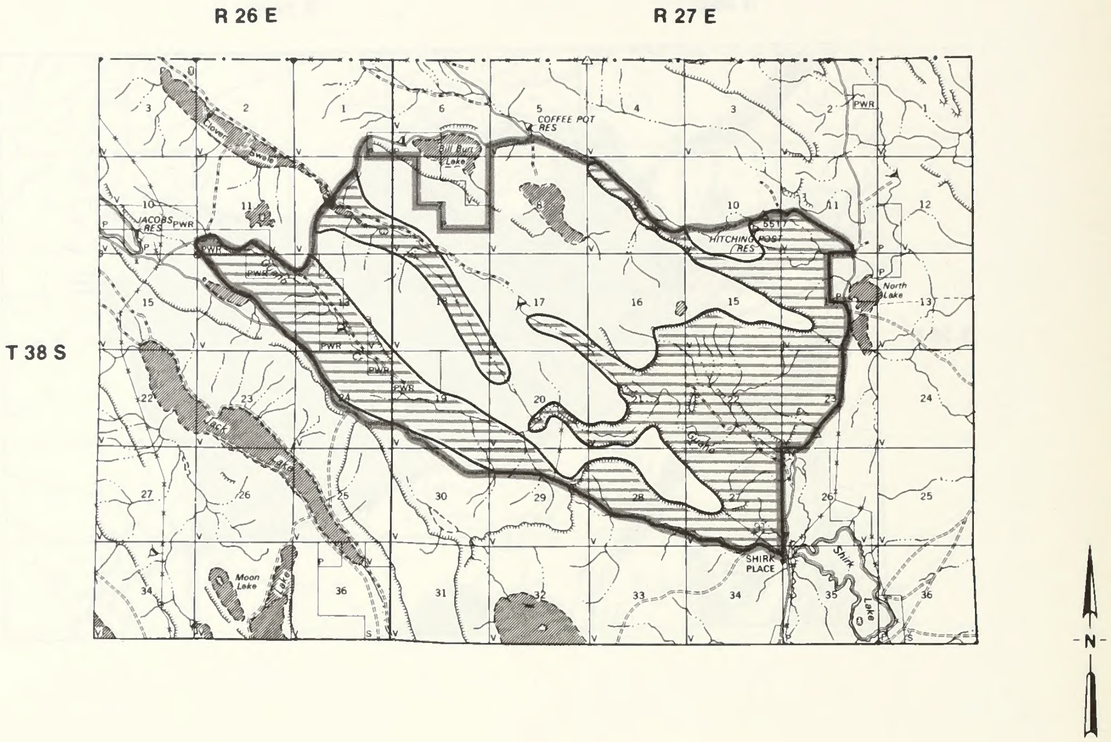
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



▤ **Moderate Potential (MB) for Diatomite**

Entire WSA:
Moderate Potential
(MB) for Mercury, Gold and Silver

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Guano Creek WSA
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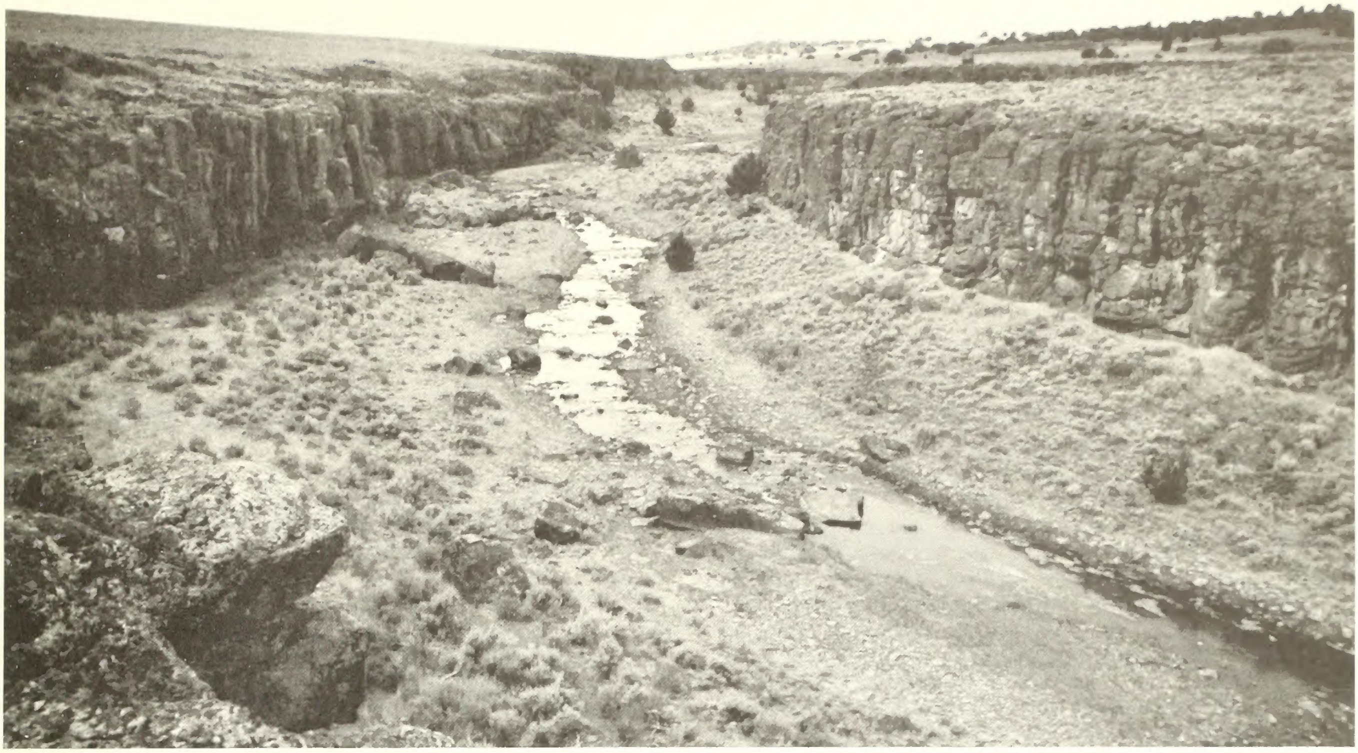
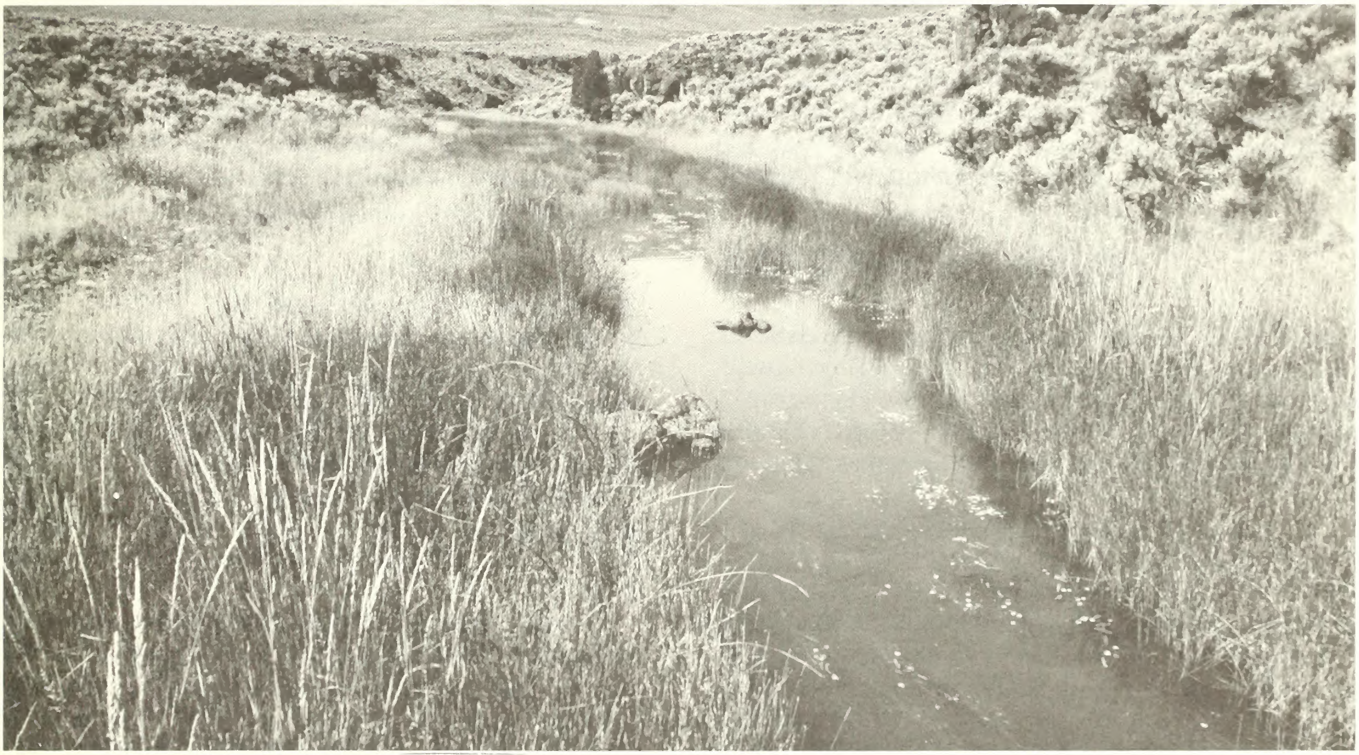
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Guano Creek WSA, OR-1-132. Low basalt cliffs along Guano Creek in the central portion of the WSA. Within the area recommended suitable under the all wilderness (proposed action) alternative. The canyon meanders through lowsage and juniper-covered draws in this part of the WSA. July 1984.



Guano Creek WSA, OR-1-132. Guano Creek as it runs through the large basin on the east side of the WSA. Within the area recommended suitable under the all wilderness (proposed action) alternative. Riparian zones such as this are important wildlife habitat in this region. July 1984.

[illegible]

[illegible]

Appendix to the Wilderness Environmental Impact Statement for Oregon

Spaulding Wilderness Study Area (OR-1-139)

1. Introduction

General Description of Study Area

The Spaulding Wilderness Study Area (WSA) is 18 miles east of Adel, Oregon, adjacent to Oregon State Highway 140 (see Map 1). The WSA is in both Lake and Harney Counties, and is approximately 50 miles east of Lakeview, Oregon.

The area contains 69,530 acres of public land and 440 acres of private land inholdings (see Map 2). One 320-acre parcel of private land is located along a dead-end road leading to Spaulding Reservoir. The WSA boundary extends up the dead-end road and around the 320-acre private parcel surrounded by BLM land. Spaulding Reservoir, a stocked fishing reservoir and an important recreation resource in the Warner Lakes area, also is surrounded by, but not included in, the WSA.

The WSA is 17 miles long from north to south and from 3 to 9 miles wide in a roughly oval shape, with a panhandle on the south. The boundaries of the WSA are defined by a high standard dirt road on the west and low standard dirt roads along the rest of the boundary, with the exception of approximately 3 miles of the southwestern boundary which follow the right-of-way of Highway 140 as it ascends Dougherty Slide. All lands adjacent to the WSA are public.

The WSA is characterized by rolling sagelands broken by low rimrock and interlaced by a network of intermittent stream drainages. Antelope Butte at the south end of the WSA rises to an elevation of 6,440 feet. Sage Hen Canyon, central to the WSA, funnels outward from steep, high rimrock to a broad swale near Spaulding Reservoir. West of the reservoir the drainage is also known as Spaulding Creek. At the south end of Sage Hen Canyon near the WSA boundary is a 1-mile series of pools known as The Potholes. These pools hold water after spring run-off well into the summer.

The western portion of the WSA is dominated by a 13-mile section of Guano Rim, also known as Dougherty Rim, reaching a height of 900 feet. The major drainage running through through Guano Rim is Rocky Canyon. In addition to Rocky Canyon, this section of Guano Rim is also incised by seven other steep canyons. Eleven sink lakes are scattered throughout the area above and to the east of Guano Rim. Along the eastern boundary of the WSA are a large erosion basin and a prominent landmark known as Chimney Rock.

Vegetation consists generally of sagebrush/bunchgrass communities, with some aspen groves, scattered mountain mahogany and juniper growing at the base of some rims. Various shrubs occur in the canyons and among the rimrock.

Interrelationships

Located on public land and surrounded by the WSA, Spaulding Reservoir is operated under a cooperative arrangement with the Oregon Department of Fish and Wildlife (ODFW). This reservoir is stocked yearly with trout to maintain a fishery for recreation purposes.

The Spaulding WSA occupies approximately 8 percent of ODFW's 2,507-square-mile Beatys Butte Wildlife Unit. ODFW's management goal for this unit is to support a summer adult population of 1,500 mule deer with a buck to doe ratio of 12 to 100. Approximately 80 mule deer inhabit the WSA year round, with peak numbers reaching approximately 250. Approximately 250 antelope inhabit the area, with peak numbers reaching 1,000. Sage grouse also inhabit the WSA in large numbers, and 16 strutting grounds have been identified within the WSA boundaries. This species is a candidate for Federal threatened and endangered status. The proposed action for this WSA conforms with ODFW management goals for game and nongame wildlife species.

Most of the WSA is in the Beatys Butte wild horse herd management area. HMA management will not be significantly affected by the proposed action or by any of the alternatives.

Neither Lake nor Harney Counties have identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for analysis in the Spaulding WSA include:

- impact on wilderness values from grazing and proposed livestock projects,
- impact on livestock grazing from wilderness designation,
- impact on sage grouse, antelope and other wildlife populations,
- impact on riparian habitat, and
- impact on recreation use, including vehicle access for hunting, and to Spaulding Reservoir for recreation and dam/fishery maintenance.

No other issues specific to the Spaulding WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (proposed action)

An enhanced wilderness alternative is not analyzed because the effects of such an alternative would not be significantly different from those of the all wilderness alternative.

An alternative was raised during the public comment period which recommended inclusion of public lands north to Beatys Butte and west to include the Basque Hills WSA. It is not analyzed because it would require the closure of necessary BLM roads and would include large parcels of private land north of the existing WSA, as well as extensive public lands found not to qualify for further wilderness study through an intensive inventory effort.

All Wilderness

The all wilderness alternative would recommend all 69,530 acres of public land in the WSA suitable as wilderness (see Map 2). The dead-end road to Spaulding Reservoir would remain open to vehicles to serve as access for wilderness users as well as for fishing at Spaulding Reservoir, and would allow for maintenance of the dam and the stocking of fish. For purposes of analysis, it is assumed the 440 acres of private inholdings would not be acquired under this alternative.

Energy and Mineral Development Actions

The all wilderness alternative would close 69,530 acres to all forms of mineral and energy entry.

Wildlife Habitat Management Actions

Habitat would be managed to sustain current herd numbers and preserve the natural interrelationships among wildlife species, in accordance with ODFW management goals, and in a manner consistent with the BLM's Wilderness Management Policy. The maintenance and preservation of existing habitat, consisting of sage flats, intermittent streams and springs, rimrock and other key vegetative and geologic features, constitute an ongoing action within the wildlife program. Two spring developments would be maintained by horseback. No new wildlife projects are projected.

Livestock Management Actions

Livestock use would remain at the current use-level of approximately 3,580 AUMs within the portion of the single allotment in the WSA (see table 4). The season of use for this allotment is April 1 to December 15.

Heavy equipment would be used to maintain 11 waterholes approximately once every 10 years. This would require use of the 13 miles of ways, as well as cross-country travel to reach existing waterholes. Other livestock management activities such as salting, gathering of animals at the end of season, and maintenance of 5 miles of fence, would be accomplished by horseback. No new livestock developments are projected.

Recreation Management Actions

Under this alternative, 69,530 acres and 13 miles of vehicle ways would be closed to motorized vehicle use. Recreation use on these ways is low during most of the year and moderate during hunting seasons. The dead-end road to Spaulding Reservoir would remain open and the dam and reservoir would continue to be maintained for watershed purposes and as a recreational fishery. Total recreation use in the WSA is approximately 200 visitor days per year.

Partial Alternative

The partial alternative would recommend 34,800 acres of public land suitable as wilderness and 34,730 acres as nonsuitable (see Map 3). The recommended suitable area constitutes roughly the northern half of the WSA and would be bounded on the south by a way which runs from The Potholes to the northwest through Rocky Canyon to the floor of Guano Valley. The boundary would then run northward to private land at Spaulding Ranch where it would follow a fence and way north for about 2 miles and then follow section lines east and north to the Buckaroo Pass road. The remaining boundaries would be as described for the all wilderness alternative.

Energy and Mineral Development Actions

Under the partial alternative, 34,800 acres would be closed to mineral and energy entry.

The 34,730 acres recommended nonsuitable under this alternative would remain open to mineral and energy entry. Exploration would occur on 34,730 acres for base metals (moderate potential). Development of one open pit mine would disturb approximately 160 acres with 3 miles of road development.

Wildlife Habitat Management Actions

In the 34,800 acre suitable portion, habitat would be managed to sustain current herd numbers and preserve the natural interrelationships among wildlife species, in accordance with ODFW management goals, and in a manner consistent with the BLM's Wilderness Management Policy. The maintenance and preservation of existing habitat, consisting of sage flats, intermittent streams and springs, rimrock and other key vegetative and geologic features, constitute an ongoing action within the wildlife program. Two spring developments would be maintained by horseback. No new wildlife projects are projected for the suitable portion.

On the 34,730 acre nonsuitable portion, approximately 660 acres of burn-and-seed would occur to improve spring forage for deer and antelope.

Livestock Management Actions

Livestock use would remain at the current level of approximately 1,790 AUMs on the 34,800 acres recommended suitable under this alternative. Heavy equipment would be used to maintain 4 waterholes once every 10 years. This would require use of 2.5 miles of ways. Maintenance of 2 miles of fence would be accomplished using horses. Other livestock management activities, such as salting and gathering, would also be accomplished using horses.

Livestock use on the 34,730-acre nonsuitable portion would increase from 1,790 to 2,122 AUMs through three burn-and-seed treatments on a total of 1,255 acres. The 332 additional AUMs would increase licensed forage to 3,912 AUMs in the WSA portion of the allotment. Two waterholes and 2 miles of pipeline would be constructed. Maintenance of 3 miles of fence would be accomplished using vehicles. Heavy equipment would be used to maintain seven waterholes as needed.

Recreation Management Actions

Under this alternative 34,800 acres, including 2.5 miles of ways would be closed to vehicles. The road to Spaulding Reservoir would remain open. Recreation use on this portion of the WSA is low for most of the year and moderate during hunting seasons, totaling about 80 visitor days per year.

The nonsuitable 34,730 acres would remain open to vehicle traffic, both off-road and on the 10.5 miles of ways. Recreation use for this area is estimated to be approximately 120 visitor days per year, mostly associated with antelope hunting.

No Wilderness/No Action (Proposed Action)

The No Wilderness/No Action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire WSA would be open to all forms of mineral entry. The moderate potential for base metals would result in exploration and development of one open pit mine directly affecting 160 acres, with 3 miles of access road constructed.

Wildlife Habitat Management Actions

Habitat would be managed to sustain current herd numbers in accordance with ODFW management goals. Forage availability for wildlife would be closely coordinated with the livestock grazing allotment management plan goals. Existing habitat including sage flats, intermittent streams and springs, rimrock, and key vegetative and geologic features, would be maintained except where projects or surface disturbance are projected.

Two spring developments would be maintained using vehicles. Burn-and-seed operations on 1,504 acres to improve deer and antelope herd nutrition would be implemented and one wildlife guzzler would be installed. (A second proposed guzzler addressed in the Draft EIS has been relocated to an area outside the WSA boundary.)

Livestock Management Actions

Livestock use would increase from the current use-level of approximately 3,580 AUMs in the WSA to 4,356 AUMs (increase of 776 AUMs) through vegetation manipulation on 2,587 acres. One of the vegetation manipulations is a 410-acre burn-for-release project. In addition to the increase of AUMs, 3 reservoirs, 2 waterholes, 2 miles of pipeline and 7 miles of fence would be permitted to fully implement and enhance livestock management.

All lands and 13 miles of ways within the study area would be open to vehicle access for livestock management, including salting and maintenance of 12 miles of fence. Heavy equipment would be used to maintain 14 waterholes and reservoirs as needed. Other livestock management activities, such as gathering of animals at the end of season, would be accomplished using horses.

Recreation Management Actions

The entire WSA would be open to vehicle access. Recreation use-levels would be expected to remain at approximately 200 visitor days per year or to increase slightly.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA is in a predominantly natural condition. This naturalness is particularly striking due to the area's large size and broad vistas, especially in the north and northeast portions. Sage Hen Canyon offers several miles of undisturbed habitat along an ephemeral stream drainage with concentrations of native vegetation.

Evidence of recent human activity is extremely isolated and unobtrusive when considering the area as a whole. The WSA contains 2 spring developments, 5 miles of fence, 11 small waterholes and reservoirs, and 13 miles of ways. Unnatural features, primarily the vehicle ways, within the WSA influence about 600 acres of the study area. The developments are sufficiently scattered that a person on foot would not sense any concentration of unnatural features.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Outstanding opportunities for solitude exist throughout the WSA. The area's large size and remote location enhance these opportunities. The northern portion of the WSA contains topography and unobstructed vistas which provide outstanding opportunities for solitude. The south half of the WSA from Antelope Butte north to Rocky Canyon at first appears rather open, but the area offers ample opportunity for isolation due to the gently-rolling terrain and the variation in height of the sage cover. The steep, convoluted canyons along Guano Rim offer exceptional opportunities for isolation and solitude.

The opportunity for solitude is constrained only by outside sights and sounds at the southern tip of the WSA, immediately adjacent to State Highway 140 and in the immediate confines near Spaulding Reservoir.

Primitive recreation opportunities are outstanding in most of the WSA for: day hiking, backpacking, camping, nature study, photography, general sightseeing, horseback riding and hunting. Sage Hen Canyon is a rugged and scenic area for hiking. The numerous canyons incising Guano Rim offer birdwatching, photographic and sightseeing opportunities. Chimney Rock on the east side of the WSA is an interesting geologic feature noted on maps of the area.

Special Features

Guano Rim is one of a series of high fault block scarps responsible for the distinctive basin and range topography of southeastern Oregon. The rim has potential for moderately dense nesting by raptors, and many aeries are present on the steep face of the rim and on the rimrock of its canyons.

Approximately 85 percent of the study area has been identified as year-long sage grouse habitat. Inventories in 1980 and 1988 tabulated a total of 16 sage grouse strutting grounds within the WSA. Four of these strutting grounds contained more than 30 birds at the time of inventory. Approximately 80 percent of sage hens nest within 2 miles of the strutting ground where mating occurs. The sage grouse is a candidate species for Federal listing under the Endangered Species Act.

The southern half of the area is crucial antelope winter range and spring kidding grounds.

Cultural resources, including a petroglyph site, are within the boundaries of the study area.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Spaulding WSA is located in the Intermountain Sagebrush Province, with a potential natural vegetation of sagebrush steppe. Vegetative communities listed by the Oregon Natural Heritage Plan in the Basin and Range section and occurring in the WSA include big sagebrush/Idaho fescue, low sagebrush/Idaho fescue, low sagebrush/Sandberg's bluegrass, silver sagebrush, aspen groves and mid- to high-elevation vernal (spring) ponds.

Other communities in the WSA include a willow-grass community in a riparian area and big sagebrush/Thurber's needlegrass community.

Spaulding WSA is within 5 hours' driving time of four standard metropolitan statistical areas with populations over 100,000: Medford, Oregon; Reno, Nevada; Boise, Idaho and Redding, California.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using geologic data in BLM files, data in a report by TERRADATA (a consulting firm under contract with BLM), and a recent report completed by the U.S. Bureau of Mines. The TERRADATA report is titled "Assessment of Geology, Energy, and Minerals Resources of the Guano Valley Geologic Resource Area."

The WSA is characterized by continental Tertiary and Tertiary to Quaternary volcanic flows, shallow intrusives, volcanically-derived sedimentary rocks, and playas and lake deposits. Very little is known about the subsurface geology; pre-Tertiary marine sedimentary rocks may exist at depth and, if present, may contain oil and gas.

The Spaulding WSA is within the Guano Valley geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral classification for the WSA. Map 4 shows the area with moderate potential for metals and high for pozzolanic tuffs.

Energy Resources

According to the rating system described above, the potential for the occurrence of oil and gas or geothermal energy within the Spaulding WSA is not considered to be significant. As of October 16, 1987, there were no oil and gas or geothermal leases within the WSA.

Mineral Resources

Moderate potential for the occurrence of base and precious metals over the entire WSA is based upon indirect evidence and minimal direct evidence resulting from a U.S. Bureau of Mines geochemical and placer sampling program, the proximity of the WSA to the Eugene-Denio lineament, and the presence of tertiary silicic volcanic rocks that in some areas exhibit epithermal mineralization.

Moderate potential for the occurrence of diatomite on 21,500 acres and for bentonite throughout the WSA is based on indirect evidence. Because of poor accessibility and more readily available deposits in southeastern Oregon, no exploration or development is anticipated.

Based upon the U.S. Bureau of Mines mineral investigation, 5,640 acres located in the northern portion of the WSA has high potential for the occurrence of pozzolanic tuffs.

Except for some road material quarry sites, there are no known mineral deposits within a 10-mile radius of the WSA. As of October 16, 1987, there were no mining claims in the WSA.

Vegetation

The WSA generally contains sagebrush/bunchgrass communities. Quaking aspen, curl-leaf mountain mahogany and western juniper occur along the rims, especially in the north end of the area. The western portion of the WSA, which is lower in elevation, consists mainly of a sagebrush/cheatgrass community, with some green rabbitbrush in the more sandy areas. Spiny hopsage, Great Basin wildrye, Indian ricegrass and creeping wildrye occur in the sandy and more alkaline areas. Shrub species occurring along rims, streams and in the vicinity of springs include snowberry, chokecherry, squaw currant and Wood's rose.

Along the very northern and eastern portions of the WSA, communities of big sagebrush/Thurber's needlegrass or Idaho fescue and low sagebrush/Idaho fescue or Sandberg's bluegrass occur. Lakebeds contain spikerushes, rushes, leafy arnica, and Schouler's plagiobothrys in the damper areas, with silver sagebrush, mat-muhly and tansy-leaved evening primrose in the drier areas.

The southern end of the study area contains extensive low sagebrush/Sandberg's bluegrass communities.

The Potholes below Sage Hen Canyon contain silver sagebrush, low sagebrush, mat-muhly, Nevada bluegrass, Baltic rush and small-flowered penstemon. Pristine areas along Sage Hen Canyon contain sedges, rushes, California oatgrass, Cusick's bluegrass, Junegrass and Geyer's onion.

The vegetative communities vary from early seral in the sagebrush/cheatgrass community to late seral in the low sagebrush/Idaho fescue community.

Wildlife Habitat

All of the Spaulding WSA is used by mule deer and pronghorn antelope. The average number of deer using the study area annually is estimated to be approximately 80 animals. An estimated 250 antelope annually frequent the area, the numbers fluctuating seasonally. Approximately half of the WSA toward the south, or about 35,000 acres, is crucial antelope winter range and kidding grounds.

Sage grouse, a candidate species for Federal threatened and endangered status, inhabit the area on a year-round basis, and 16 strutting grounds have been located within the WSA (see Special Features section). Approximately 80 percent of sage hens nest within 2 miles of the strutting ground where mating occurs.

Raptors use the Guano Rim portion of the WSA which has potential as a moderately dense nesting area for raptors, though no formal inventory has been conducted. The area also supports badgers, coyote, bobcat, mountain cottontail, jackrabbit, ground squirrel and numerous other rodents, toads, western rattlesnakes, fence and horned lizards, burrowing owl, chukar, raven, loggerhead shrike, mallards, gadwall, kildeer, sage sparrow, Brewer's sparrow, canyon wren, horned lark and many other wildlife species.

Two springs have been developed in the WSA for wildlife: Horse Spring in the south and Double Rim Spring near the northern boundary.

Watershed

There are no permanent streams in the WSA. The Potholes, a 1-mile series of pools at the south end of Sage Hen Canyon, hold water long after spring runoff. The Sage Hen Canyon drainage supports an ephemeral stream which is the source for Spaulding Reservoir. Water quality ranges from good in the spring to poor in the late summer due to both natural stagnation and contamination by livestock waste.

Livestock Grazing

All grazing in the WSA is within the Beatys Butte grazing allotment. Table 4 summarizes existing and potential grazing use in AUMs. Current use within the WSA is approximately 3,580 AUMs.

Existing livestock projects in the study area include 5 miles of fence and 11 waterholes and reservoirs. Vehicles are used approximately five times per year for salting livestock within this large segment of the allotment as quantities needed make placement by horseback impractical. Vehicles are also used when necessary for fence repair. Most checking and gathering of livestock utilizes horses.

Recreation Use

The WSA is a popular deer and antelope hunting area, particularly along the boundaries and in the south. Both deer and antelope hunting are controlled by a permit management system. Five hundred mule deer tags are issued for the Beatys Butte Management Unit, and 150 antelope tags are issued for the East Beatys Butte portion of the Management Unit in which the WSA is located. (ODFW divides the Beatys Butte unit into east and west portions for purposes of issuing antelope tags.) As the antelope congregate more in the WSA portion of the hunt unit, the number of hunters in this area would be higher than indicated by the percentage of area alone.

Hunting for upland game birds occurs in the WSA to a lesser degree than for big game mammals.

Hunting is the primary vehicle-oriented recreation activity, accounting for approximately 150 visitor days per year. Primitive recreation use in the area is estimated at approximately 50 visitor days per year at present. Total recreation use is approximately 200 visitor days per year.

Local Personal Income

Livestock use at the current level of 3,580 AUMs and recreation use totaling 200 visitor days annually are the primary resource outputs resulting from economic activity in the WSA. Approximately $42,960 of local personal income is generated each year from livestock grazing. Another $2,400 is generated annually from recreation use, for an overall total of $45,360. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in the Spaulding WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 69,530 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and wilderness values within the entire 69,530 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features of habitat for raptors, antelope, mule deer, sage grouse and nongame wildlife species, as well as to cultural resources and native plant communities would also be protected or enhanced.

Naturalness

The naturalness of the area's broad expanses of native rangelands would be enhanced by prohibiting motorized vehicle use. Closure of 13 miles of ways would allow them to revegetate, enhancing the natural appearance of the study area and allowing vegetation to recover on 13 acres. The limited use of vehicles on ten-year cycles to maintain waterholes with heavy equipment would cause temporary disturbance, but would not prevent revegetation from occurring.

Solitude

Opportunities for solitude provided by the area's large size and its remoteness would be enhanced by the elimination of vehicle use of 13 miles of ways. Livestock operations and maintenance of developments would cause short-term disturbance, less than five days per year in total, to solitude from vehicle noise and presence.

Opportunities for Primitive and Unconfined Recreation

Primitive recreation opportunities such as black-powder and bow hunting, backpacking, photography and horseback riding would be enhanced by the wilderness setting that would be preserved under this alternative. This type of recreation would be expected to increase by approximately 50 visitor days per year due to the restriction of vehicle traffic. The exclusion of vehicles would reduce the scattering game and other wildlife species and eliminate an unnatural element in the natural environment sought by primitive recreationists.

Special Features

The special features of Guano Rim would be preserved and protected under the all wilderness alternative. Habitat for the Federal candidate sage grouse would be protected from proposed vegetative manipulation projects affecting 4,091 acres within the study area. Crucial antelope winter range and kidding grounds would be preserved on about 35,000 acres, as would mule deer habitat on 69,530 acres. Habitat would be enhanced by the elimination of vehicles which disturb and move animals when traveling cross-country or on the 13 miles of ways.

Cultural resources would receive enhanced protection afforded by the closure of 13 miles of ways, which would limit access for theft and vandalism.

Conclusion: Wilderness designation of the entire 69,530 acres within the Spaulding WSA would result in the protection and enhancement of existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 69,530 acres to mineral and energy entry.

Energy Development

No exploration or development for energy resources would occur or would be foregone. The 69,530 acres recommended nonsuitable under this alternative would be open to energy exploration and development. The potential for occurrence of oil and gas and geothermal resources is considered to be low.

Conclusion: No impact to energy development is expected.

Mineral Development

Although moderate potential exists for the occurrence of diatomite, bentonite, and pozzolanic tuffs in the WSA, no exploration or development is expected or would be foregone due to available sources outside the WSA and expected markets.

Exploration for and development of precious metals (gold, silver, and mercury) would be foregone on the 69,530 acres designated wilderness. This would include development of one open pit mine directly affecting 160 acres.

Conclusion: One 160-acre open pit mine for extraction of metallic minerals would be foregone.

Impacts on Vegetation

The all wilderness alternative would preserve native vegetation within the study area by precluding vegetative manipulation for livestock and wildlife which would intentionally introduce exotic species such as crested wheatgrass and a 776-AUM increase in livestock grazing. Closure of 13 miles of way would allow revegetation on 13 acres within 4 to 5 years.

Conclusion: Existing native vegetative communities would be retained and 13 miles of ways would revegetate.

Impacts on Wildlife

Existing habitat for 80 deer, 250 antelope, raptors and other wildlife species would be preserved. Sixteen sage grouse strutting grounds would remain undisturbed. Five burn-and-seed projects totaling 1,504 acres and the installation of one wildlife guzzler for antelope would be foregone, although these projects are not necessary to maintain the area's present antelope population. No net change in wildlife numbers is expected.

Conclusion: Existing wildlife habitat for all species would be preserved under this alternative.

Impacts on Watershed

No change in watershed condition in Sage Hen Canyon is anticipated.

Impacts on Livestock Grazing

Livestock use would continue at the current level of 3,580 AUMs within the study area. Wilderness designation would preclude the allocation of an additional 776 AUMs through rangeland development. The 13 miles of ways would not be available for five trips per year to salt livestock. Maintenance of waterholes and reservoirs would be accomplished by the use of heavy equipment once every 10 years.

Conclusion: Livestock use levels would continue at 3,580 AUMs. Minor inconvenience and slight additional expense to the livestock operator would accrue, primarily for hauling salt, due to vehicle restrictions on 13 miles of ways.

Impacts on Recreation Use

The 69,530-acre WSA and its 13 miles of ways would be closed to vehicle use, resulting in a projected decline of approximately 50 to 100 visitor days per year in vehicle-oriented hunting, which would be displaced to areas outside the WSA. Primitive hunting opportunities would increase, with a possible 50-visitor-day increase in annual use. Vehicle access to Spaulding Reservoir would be maintained for fishing and access to the wilderness area. The net impact on visitor days would be a generally static condition with a possible loss of up to 50 visitor days.

Conclusion: Net recreational use would remain static at about 200 visitor days per year, or decline by up to 50 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 3,580 AUMs. Recreation use is expected to remain at approximately 200 visitor days per year or to decrease by up to 50 visitor days per year.

The effects on local personal income generated from these activities, as shown in Table 5, are a maintenance of approximately $42,960 from grazing and a possible decline of $600 from recreation use.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $45,400 or decline by approximately $600.

Partial

Recommended suitable for wilderness: 34,800 acres
Recommended nonsuitable for wilderness: 34,730 acres

Impacts on Wilderness Values

Under this alternative, 34,800 acres (approximately one-half of the WSA) would be protected by special legislative mandate. The wilderness values of naturalness, solitude, opportunities for primitive and unconfined recreation, the sage grouse habitat and strutting grounds, and a small portion of the raptor nesting area on Guano Rim would be protected.

Wilderness values on 34,730 acres, including raptor nesting habitat on Guano Rim, sage grouse habitat and the antelope kidding grounds in southern portion of the WSA, would not receive special legislative protection and would be affected by other activities, such as vegetation manipulation for livestock and wildlife and vehicle-oriented recreation.

Naturalness

Within the 34,800 acres recommended suitable under this alternative, naturalness would be preserved and enhanced by the elimination of vehicles on 2.5 miles of ways directly impacting approximately three acres and visually influencing about 100 acres.

The remaining 34,730 acres recommended nonsuitable for wilderness would be subject to burn-and-seed treatments on 1,915 acres in six separate areas altering, by the introduction of non-native grass species, natural biotic interrelationships and reducing the area's appearance of naturalness. The construction of two waterholes and 2 miles of pipeline would also locally impact naturalness, directly impacting 27 acres, with an indirect influence on naturalness on approximately 80 acres. Continued vehicle access on 10.5 miles of ways would prevent revegetation of 10 acres within these tracks. Mineral development would directly impact approximately 160 acres through mine development and roads, with an indirect impact on approximately 600 acres. Overall, naturalness would be diminished on about 2,600 acres of the WSA.

Solitude

Opportunities for solitude would be preserved and enhanced on the 34,800 acres recommended suitable by the closure of 2.5 miles of ways to motorized vehicles.

On the nonsuitable half of the study area, range projects directly affecting approximately 1,940 acres would result in local disturbance during the initial implementation of these projects by the presence and noise of vehicles and heavy equipment. These projects include the construction of 2 miles of pipeline, two waterholes and the burning and seeding of 1,915 acres at six sites. Opportunities for solitude would continue to be impacted by increased vehicle traffic for vehicle-related recreation (hunting) and for livestock management activities on ways or roads resulting from the construction of the two waterholes and the pipeline. Opportunities for solitude would be curtailed intermittently or for short-term periods on about 4,000 acres in the nonsuitable portion.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation within the portion of the WSA recommended suitable would be enhanced to a degree by the elimination of vehicle-oriented recreation from the 34,800 acres, including 2.5 miles of ways. Primitive recreation would be expected to increase slightly, approximately 50 visitor days per year.

In the nonsuitable portion, opportunities for primitive and unconfined recreation would be directly impacted by management activities on approximately 2,100 acres. Burn-and-seed treatments on six areas totaling 1,915 acres, construction of 2 miles of pipeline and of 2 waterholes, and establishment of one pit mine would diminish the natural setting and the opportunities for nature study, photography and sightseeing. Primitive types of hunting, backpacking, camping, photography and sightseeing would all be affected by the presence of vehicles on the 10.5 miles of ways, which visually affect approximately 500 acres. Mining activity would directly remove 160 acres from recreation use and have an indirect impact on 600 additional acres by degrading primitive recreation values. Indirect impacts of development would reduce primitive recreation values on approximately 2,600 acres.

Special Features

Approximately 10 percent of both the raptor nesting habitat of Guano Rim and sage grouse habitat, including six strutting grounds, would receive wilderness legislative protection under the partial alternative. Approximately 50 percent of the WSA's mule deer range and 7,000 acres of its antelope winter range with kidding grounds would also be protected. Cultural resources on these 34,800 acres would receive the added protection afforded by wilderness designation. The primary physical protection to these resources would stem from the exclusion of vehicles.

Approximately 90 percent of the sage grouse habitat including 10 strutting grounds, 50 percent of the mule deer range, and 28,000 acres of the antelope winter range (with kidding areas) would be subject to vehicle disturbance under this alternative. Three sage grouse strutting grounds peripheral to one of the three projected burn-and-seed projects may also be abandoned. Cultural resources on 34,730 acres would also be subject to continued vehicle access and theft or destruction associated with the easier access afforded by vehicle travel.

Conclusion: The partial alternative would preserve wilderness values on approximately half of the WSA, which possesses less than half of the area's special features. Wilderness values would be directly impacted on approximately 2,100 acres and indirectly on 2,600 additional acres of the nonsuitable portion, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 34,800 acres to mineral and energy entry. The 34,730 acres recommended nonsuitable under this alternative would remain open to mineral and energy entry.

Energy Development

No exploration or development for energy resources would occur or would be foregone. The 34,730 acres recommended nonsuitable under this alternative would be open to energy exploration and development.

Conclusion: No impact to energy development is expected.

Mineral Development

Wilderness designation would withdraw 34,800 acres from all appropriations under the mining or mineral leasing laws. The 34,730 acres recommended nonsuitable would be open to mineral entry.

Exploration for and development of precious metals (gold, silver, and mercury) would be precluded on the 34,800 acres designated wilderness. Exploration would be anticipated on the nonsuitable 34,730 acres nonsuitable with potential development of one open pit mine directly impacting 160 acres and the development of 3 miles of road.

Conclusion: Development on 34,800 acres with moderate potential for precious metals would be foregone. Exploration for precious metals on 34,730 acres and development of one open pit mine would occur.

Impacts on Vegetation

Existing vegetation would be preserved on 34,800 acres. Closure of 2.5 miles of ways to vehicle traffic would allow for their revegetation in 3 to 5 years.

Under the partial alternative, 1,915 acres of native vegetation in the nonsuitable portion would be converted to crested wheatgrass through wildlife and livestock burn-and-seed projects, thus reducing vegetative diversity by temporarily eliminating shrubs and forbs. Construction of 2 waterholes would directly remove vegetation on approximately 4 acres, with additional ongoing disturbance to an additional 10 acres around each waterhole due to livestock concentration. Construction of 2 miles of pipeline would directly remove vegetation on approximately 3 acres, with additional ongoing impacts to approximately 10 acres surrounding the terminal water-holding facility. Continued vehicle use on 10.5 miles of ways would prevent revegetation of about 10 acres. Mineral development would directly remove vegetation on approximately 160 acres in the area recommended nonsuitable.

Conclusion: This alternative would result in the preservation of existing vegetation on 34,800 acres. Native vegetation would be lost on approximately 2,100 acres.

Impacts on Wildlife

Wildlife habitat for all species would be managed to preserve natural ecosystem relationships existing on 34,800 acres under this alternative. The 34,800-acre area includes six sage grouse strutting grounds within the year-round sage grouse habitat, year-round deer habitat, 7,000 acres of its antelope winter range (with kidding grounds), and about 10 percent of the raptor nesting area on Guano Rim. One guzzler to benefit antelope would not be developed, although this would not affect the ability of the WSA to support present numbers of antelope.

The nonsuitable 34,730 acres include approximately 90 percent of the raptor nesting habitat, 10 strutting grounds within year-round sage grouse habitat, 34,730 acres of the WSA's habitat for mule deer and 28,000 acres of the antelope winter range with kidding grounds. Three burn-and-seed projects to improve deer and antelope habitat on 660 acres in the nonsuitable portion would be allowed. These projects could negatively impact other wildlife species, particularly sage grouse, since three strutting grounds located on the periphery of one of the proposed treatment areas may be abandoned.

Conclusion: Existing wildlife habitat would be preserved on 34,800 acres. Burn-and-seed treatments on 660 acres in the nonsuitable portion would benefit deer and antelope, but cause negative impacts to sage grouse habitat.

Impacts on Watershed

Watershed and water quality would not be degraded beyond current levels on 34,800 acres designated as wilderness. Watershed and water quality at The Potholes within the nonsuitable portion of the WSA would be degraded by increases in grazing pressure resulting from the additional 332 AUMs of forage produced by burn-and-seed treatments in the nonsuitable portion of the WSA. Standing pools and shade in this area attract cattle; increases in the number of cattle using the area would increase the trampling and fecal contamination, thereby degrading water quality.

Conclusion: Watershed and water quality would be degraded on approximately 160 acres at The Potholes. Present values would be preserved on 34,800 acres.

Impacts on Livestock Grazing

Livestock use would remain at the current level of approximately 1,790 AUMs within the portion of the study area recommended suitable for wilderness. Wilderness designation would preclude the allocation of an additional 444 AUMs through rangeland development. The 2.5 miles of ways in the suitable portion would not be available for five trips per year to salt livestock. Maintenance of waterholes and reservoirs by heavy equipment would occur once every 10 years.

In the nonsuitable portion of the study area, 1,915 acres of vegetative manipulation would be allowed, providing 332 additional AUMs of licensed forage for livestock within the allotment. Two waterholes and 2 miles of pipeline would be constructed for the purpose of better distribution of livestock within the allotment. Vehicle access for livestock management activities on 10.5 miles of ways would continue.

Conclusion: Approximately 332 AUMs in increased forage and the construction of two waterholes and 2 miles of pipeline would be realized under this alternative.

Impacts on Recreation Use

The 34,800 acres designated wilderness would be closed to vehicles, including 2.5 miles of ways. Approximately 10 percent of the vehicle-oriented antelope hunting occurs in this portion of the WSA. A slight decline in vehicle-oriented recreation visitor days would be expected. However, net recreation use would remain static or show only slight decrease due to offsetting primitive recreation use.

In the nonsuitable portion, 10.5 miles of ways would remain open to vehicle traffic. Approximately 90 percent of the vehicle-oriented antelope hunting occurs in this portion of the WSA. Recreation use for this type of activity is not expected to change.

Conclusion: Overall use would remain at about 200 visitor days per year.

Impacts on Local Personal Income

An increase of 332 AUMs of allocated forage would result in an increase in local personal income of approximately $3,984 per year. In addition, development of a metallic mine would generate an undetermined amount of local personal income each year. Income from recreation use would not change since use numbers are expected to remain static.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be an increase of approximately $4,000 annually, plus an additional unknown increase from mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by at least $4,000.

No Wilderness/No Action (Proposed Action)

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 69,530 acres

Impacts on Wilderness Values

Under the no wilderness alternative, the entire 69,530 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and the area's special features, including sage grouse, antelope and mule deer habitat, raptor nesting habitat and cultural resources would be subject to the effects of the projected management actions. These actions include vegetative manipulation on 4,091 acres, construction of three reservoirs, two waterholes, 2 miles of pipeline and 7 miles of fence, and continued recreational vehicle use on 13 miles of ways. Mineral development would alter permanently approximately 160 acres from direct impact and an additional 600 acres from indirect impacts.

Naturalness

Continued vehicle use on 13 miles of ways would maintain their impact, visually affecting naturalness on approximately 600 acres. Burn-and-seed projects would affect the appearance of naturalness on 4,091 acres. The effect on 410 acres of burn-for-release would be short term, returning to a natural appearance in one or two growing seasons. The 3,681 acres burned and seeded to crested wheatgrass would maintain an unnatural appearance due to the introduction of the exotic species of grass. A 776-AUM increase resulting from these projects would further affect the area's naturalness due to an increase in trampling around water sources and an increase in utilization of forage resulting in a more grazed appearance with less residual ground cover.

Construction of two waterholes (directly affecting 4 acres), three reservoirs (directly affecting 6 acres), 2 miles of pipeline (directly affecting 3 acres) and 7 miles of fence (directly affecting 5 acres) would affect naturalness on an additional 18 acres. The collective visual impact of these construction projects is estimated to be approximately 1,000 acres.

Mining for precious metals would directly affect the naturalness of 160 acres and visually affect about 600 acres.

Solitude

Continued vehicle use on 13 miles of ways would result in repeated short-term impairment of opportunities for solitude in the vicinity of the activity. The increase in vehicle ways resulting from construction of range projects would encourage more vehicle use in the WSA, including cross-country use, further reducing opportunities for solitude in areas which do not presently have vehicle access.

Primitive and Unconfined Recreation

Continued vehicle use on cross-country and on 13 miles of ways would continue to impact primitive, non-motorized recreation opportunities in the vicinity of these ways. Increased vehicle access necessary to construct and maintain the numerous proposed livestock development projects, the associated slight increase in vehicle use of these ways for recreation purposes, and the presence of the new livestock projects themselves would further reduce opportunities for primitive and unconfined recreation within the WSA. Allocation of an additional 776 AUMs in grazing use would increase impacts to water sources and shady areas where livestock tend to concentrate. The alteration of the natural landscape by vegetative manipulation and range project construction, and the reduction in the diversity of and native vegetation and wildlife habitat, would reduce opportunities for such primitive types of recreation as photography, nature study and wilderness camping.

Mineral development would impact 160 acres directly and approximately 600 additional acres indirectly by reducing primitive recreation experiences in the area.

Special Features

Of the area's special features, the most likely to be impacted by a no wilderness action would be habitat for the Federal candidate sage grouse species. The entire study area is year-round habitat for the sage grouse, and 16 strutting grounds have been identified within its boundaries. Seven of these sites are peripheral to or within 2 miles of proposed projects. Project development and increased human and livestock concentrations and activity would disturb habitat directly by alteration and indirectly by activity pressure which would move the grouse out of their habitat.

Antelope and mule deer habitat would be impacted by the construction of 7 miles of fence by introducing barriers to movement. Antelope and deer habitat would be improved by the implementation of burn-and-seed projects which would increase spring forage and by the installation of a wildlife guzzler near Chimney Rock.

Raptor nesting habitat on Guano Rim is not expected to be affected by this alternative.

Cultural resources would be exposed to disturbance by the increase in livestock numbers associated with production and allocation of additional forage (776 AUMs). The increase in vehicle ways resulting from construction of waterholes, reservoirs and fences could result in an increase in illegal collection of artifacts due to ease of access to presently inaccessible areas.

Conclusion: In the absence of wilderness designation, projected activities would both directly and indirectly impair wilderness values over approximately seven percent of the WSA (approximately 5,000 acres), with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire 69,530 acres would be open to mineral entry.

Energy Development

No moderate or high potential for energy development exists.

Conclusion: There would be no impact on energy development.

Mineral Development

Moderate potential for metals (gold, silver, mercury) would lead to exploration, and development of one open pit mine is projected. This projection does not vary from the partial alternative as insufficient data is available prior to extensive exploration to project exact site location. Development would lead to approximately 3 miles of road construction and direct disturbance of 160 acres for the mine.

Conclusion: Exploration for precious metals on 69,530 acres and development of one open pit mine would occur.

Impacts on Vegetation

Vegetation would be altered on 3,681 acres by burn-and-seed treatments which would change existing vegetation from a sagebrush/bunchgrass community to a community dominated by crested wheatgrass. An additional 410 acres would be burned to reduce sagebrush competition with native bunchgrasses. With the increase in forage resulting from these treatments on 4,091 acres, an additional 776 AUMs would be allocated for livestock. This increase in numbers of cattle would reduce residual ground cover around water sources by grazing pressure and trampling. This effect would also be expected in shady areas where cattle tend to congregate in hot weather.

The construction of two waterholes and three reservoirs would remove vegetation from 10 acres collectively, with additional impacts to vegetation due to livestock concentrations in their vicinity. The construction of 2 miles of pipeline would remove vegetation from approximately 3 acres. Livestock attracted to the new water source and concentrating in its vicinity would graze and trample vegetation on an additional 5 to 10 acres. Construction of a total of 7 miles of fence would disturb vegetation on about 5 acres along the fencelines, initially during construction by the movement of vehicles and fencing materials. There would also be continuing impact to vegetation where livestock tend to trail next to the fence, and from occasional fence maintenance.

Mining would cause removal or alteration of vegetation on about 160 acres. The installation of a wildlife guzzler would remove vegetation from approximately 100-square-feet of soil.

Conclusion: Projected developments would alter the present vegetative composition on approximately 3,860 acres. There would also be a slight decrease in residual ground cover.

Impacts on Wildlife

Antelope and deer habitat would improve through 1,504 acres of burn-and-seed treatments providing more early spring feed and through installation of a wildlife guzzler in the vicinity of Chimney Rock. Other wildlife species would also benefit from the guzzler.

Sage grouse habitat and reproductive success would be reduced by four of the vegetative manipulation projects which are within 2 miles or less of 7 sage grouse strutting grounds. Approximately 80 percent of sage hens nest within 2 miles of the strutting ground where mating occurs. Increases in livestock numbers associated with seedings also increases the risk of trampling of nests.

The increased vehicle use for the construction and maintenance of proposed livestock projects, and the opening of new areas to vehicle access would tend to disturb and move game animals and other wildlife species, especially during hunting season when vehicle traffic is heaviest.

Conclusion: Antelope and deer would benefit from improved spring forage. Sage grouse would suffer from alteration of habitat and reproductive success would decline.

Impacts on Watershed

Watershed and water quality at the perennial springs would probably not be affected because both are fenced to exclude livestock. With the 776-AUM increase in livestock grazing resulting from burn-and-seed treatments, watershed and water quality would be expected to decline at The Potholes in the eastern portion of the WSA, where more cattle would concentrate at the standing pools and north-facing rimrock during the heat of summer, increasing the potential for erosion and contamination with fecal material.

Conclusion: Watershed and water quality would be expected to decline on 160 acres around The Potholes.

Impacts on Livestock Grazing

Licensed forage allocation for livestock would increase by 776 AUMs as a result of vegetation manipulation projects on 2,587 acres. Three reservoirs, two waterholes, 2 miles of pipelines and 7 miles of fence would be constructed to improve livestock distribution within the allotment and to enhance livestock management.

The entire 69,530 acres, including 13 miles of ways, would be open to vehicle access for livestock management, including salting and maintenance of 12 miles of fence. Heavy equipment would be used to maintain 14 waterholes and reservoirs. Other livestock management activities would be accomplished by horseback.

Conclusion: Increase in forage allocation of 776 AUMs would be realized, as would construction of 5 watering facilities, 2 miles of pipeline and 7 miles of fence.

Impacts on Recreation Use

The entire WSA would be open to vehicle use. Range development projects which would be realized under this alternative would increase opportunities for vehicle access for recreation purposes by providing more access routes to the interior of the WSA. Recreation use could increase as much as 60 visitor days per year.

Primitive recreation opportunities such as wilderness camping, backpacking, photography and nature study would be reduced due to increases in vehicle use within the study area, vegetative manipulation and other range projects which would alter the natural character of the land and reduce the extent of unimpaired vistas. A decline of 10 visitor days per year could be expected.

Conclusion: Vehicle-oriented recreation would be expected to increase within the WSA under this alternative. Primitive recreation would be expected to decrease. Overall recreation use would be expected to increase to approximately 250 visitor days per year.

Impacts on Local Personal Income

A 776-AUM increase in forage allocation would generate an additional $9,312 in local personal income annually. Mineral development would also increase local personal income, but it is difficult to predict the exact amount. An increase of 50 visitor days of recreation use each year would generate another $600 of local personal income annually, for a total of $9,912 or more.

The effects of these increases in resource output are shown in Table 5. The total effect on local personal income would be a net increase of approximately $9,900, plus annual income from mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by at least $9,900.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (No Wilderness/No Action), livestock grazing vegetative manipulation projects, construction of 3 reservoirs, 2 waterholes, 2 miles of pipeline, 7 miles of fence, and continued vehicle use of 13 miles of ways would directly impair the area's wilderness values on about 3,860 acres. Wilderness values of naturalness, opportunities for solitude and primitive and unconfined recreation and special features would be directly and indirectly impacted on approximately 5,000 acres.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, short-term consumptive uses would continue, with an increase in livestock grazing by 776 AUMs and in livestock management activities, including the construction of waterholes, reservoirs, pipeline and fences. The long-term productivity of wilderness values would be directly lost on approximately 3,860 acres from surface disturbance of projected developments, and indirectly impaired on an additional 1,240 acres, with further declines from other uses over the long term.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be an irreversible commitment of wilderness resources on approximately 5,000 acres of the WSA. Mineral resources which are developed would also be irretrievably committed.

5. Wilderness Manageability and Rationale for Proposed Action

Manageability of the Area as Wilderness

The areas recommended suitable for wilderness in the All Wilderness and Partial alternatives would be manageable as wilderness. The southern part of the WSA under the all wilderness proposal would require extra patrol efforts during hunting season to prevent vehicle incursions.

Rationale for the Selection of the Proposed Action

The No Wilderness/No Action alternative is the proposed action because the benefits of retaining options for increasing livestock forage production, improving deer and antelope habitat, and developing mineral resources outweigh the benefits of preserving the area's wilderness values.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations of rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues are addressed in the Statewide volume.

Comment: An alternative which would expand this WSA to include Beatys Butte and the Basque Hills WSA should be considered. **Response:** This alternative is not analyzed because it would require the closure of necessary BLM roads and would include large parcels of private land north of the existing WSA, as well as extensive public lands found not to qualify for further wilderness study through an intensive inventory effort.

Comment: Not enough emphasis is put on sage grouse habitat. **Response:** Additional information on sage grouse has been added to this appendix both in the Special Features and Wildlife Sections. A recent inventory of sage grouse strutting grounds in the eastern portion of the Lakeview District (January, 1988) show 16 sage grouse strutting grounds within the WSA. Four of these strutting grounds contained more than 30 birds at the time of the inventory.

Table 1. Summary of Proposed Management Under Each Alternative, Spaulding WSA (OR-1-139)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	69,530	34,800	0
Acres Closed to ORVs by Wilderness Designation	69,530	34,800	0
Miles of Ways Closed	13	2.5	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	69,530	34,800	0
Mines Developed (number)	0	1	1
Road Constructed (miles)	0	3	3
Structural Wildlife Projects Developed:			
Catchments & Guzzlers (number)	0	0	1
Vegetative Manipulation for Wildlife:			
Brush Control with Seeding (acres)	0	660	1,504
Structural Livestock Projects Developed:			
Reservoirs & Waterholes (number)	0	2	5
Pipelines (miles)	0	2	2
Fences (miles)	0	0	7
Vegetative Manipulation for Livestock:			
Brush Control with Seeding (acres)	0	1,255	2,177
Brush Control without Seeding (acres)	0	0	410
Increase in Livestock Allocation from Projects (AUMs)	0	332	776

Table 2. Summary of Environmental Consequences of Alternatives, Spaulding WSA (OR-1-139)

Resource or Activity	All Wilderness	Partial	No Wilderness/No Action (Proposed Action)
Wilderness Values	Wilderness designation of 69,530 acres would result in protection and enhancement of existing wilderness values.	Wilderness designation would protect and enhance wilderness values on 34,800 acres. In the nonsuitable portion, projected actions would directly impair wilderness values on 2,100 acres.	Projected actions would impair wilderness values over approximately 5,000 acres of the WSA.
Energy and Mineral Development	Development of one open pit mine would be foregone.	Development on 34,800 acres with moderate potential for precious metals foregone. Development of an open pit mine would occur in nonsuitable portion. No impact to development of diatomite, bentonite or pozzolanic tuffs since no exploration or development is anticipated.	No impact to mineral development. Development of one open pit mine would be realized.
Vegetation	Existing native vegetation communities retained and 13 miles of ways would revegetate.	Native vegetation preserved on 34,800 acres. In the nonsuitable portion, 2,100 acres altered by proposed management actions.	Projected actions would alter native vegetation on 3,860 acres, with a slight decrease in residual ground cover resulting from a 776 AUM increase in livestock grazing.
Wildlife	Habitat and populations would be maintained throughout the area.	Existing habitat would be preserved on 34,800 acres. Antelope and deer habitat would be improved on 660 acres in the nonsuitable portion; negative impacts to sage grouse habitat on the same acreage.	Antelope and deer habitat improved by vegetative manipulation and installation of one guzzler. Sage grouse habitat altered on 3,860 acres, with decline in reproductive success.
Watershed	No change in present condition.	Watershed and water quality degraded on 160 acres at The Potholes.	Watershed and water quality degraded on 160 acres at The Potholes.
Livestock Grazing	Minor inconvenience and slight increase in cost to operators due to restrictions on 13 miles of ways.	332-AUM increase in forage allocation, construction of 2 waterholes and 2 miles of pipeline would be realized.	Livestock use would increase by 776 AUMs. 3 reservoirs, 2 waterholes, 2 miles of pipeline and 7 miles of fence would be constructed. No restrictions on vehicle access.
Recreation Use	No change or slight decline in recreation use numbers. Type of use would shift from vehicle-oriented to primitive.	Use level not affected. Shift from vehicle-oriented to primitive recreation in suitable portion due to closure of 2.5 miles of ways.	Slight increase in recreation use numbers, with vehicle-oriented use increasing and primitive use decreasing.
Local Personal Income	Local personal income would remain at approximately $45,400, or decline by approximately $600..	Annual local personal income would increase by at least $4,000.	Annual local personal income would increase by at least $9,900.

Table 3. Classification of Energy and Mineral Potential, Spaulding WSA (OR-1-139)

Commodity	Area	Level of Potential	Level of Certainty
Metals (base & precious)	Entire WSA	M	C
Geothermal	Entire WSA	L	B
Uranium/Thorium	See Map 4	L	B
	Rest of WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	A
Limestone	Entire WSA	0	C
Bentonite	Entire WSA	M	B
Diatomite	See Map 4	M	B
	Rest of WSA	0	B
Zeolites	Entire WSA	L	B
Pozzolanic Tuffs	See Map 4	H	D
	Rest of WSA	L	B

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource'

Level of Certainty

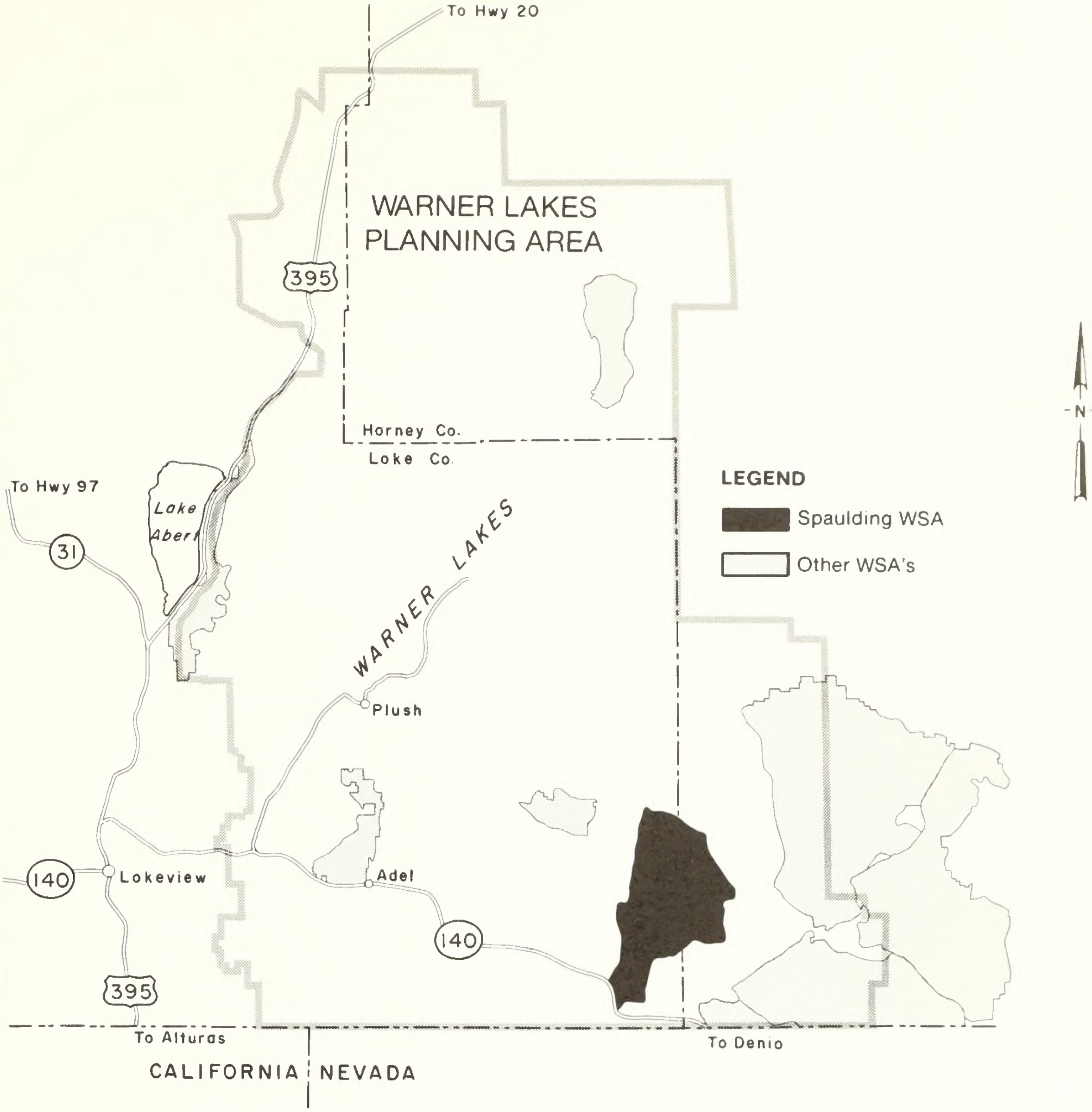
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

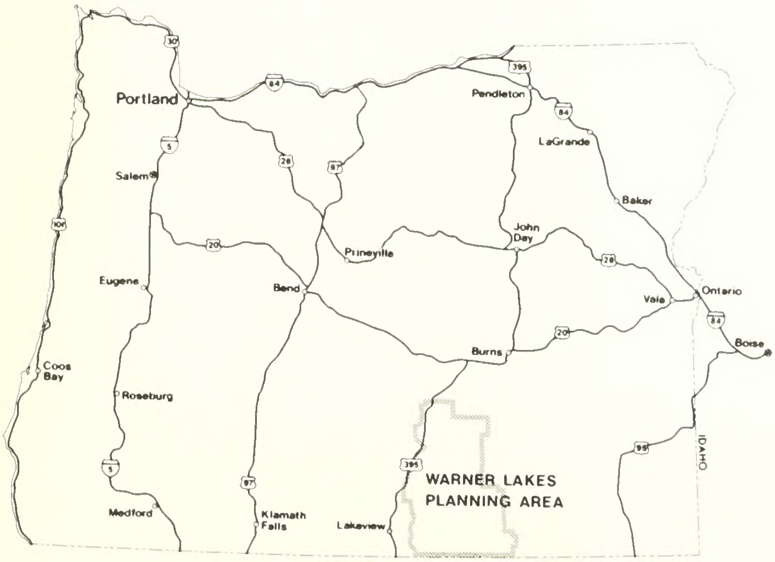
Table 4. Existing Livestock Use, Spaulding WSA (OR-1-139)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Beatys Butte	26,121	04/01-12/15	15	3,580

Table 5. Effects of Alternatives on Local Personal Income, Spaulding WSA (OR-1-139) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	no change	332	776
Mineral Development:				
Metallic Mines	Number	no change	1	1
Recreation Use	RVD	no change to -50	no change	+50
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	0	+4,000	+9,300
Mineral Development:				
Metallic Mines	$	0	unknown	unknown
Recreation Use	$	0 to -600	0	+600
Total		0 to -600	+4,000	+9,900





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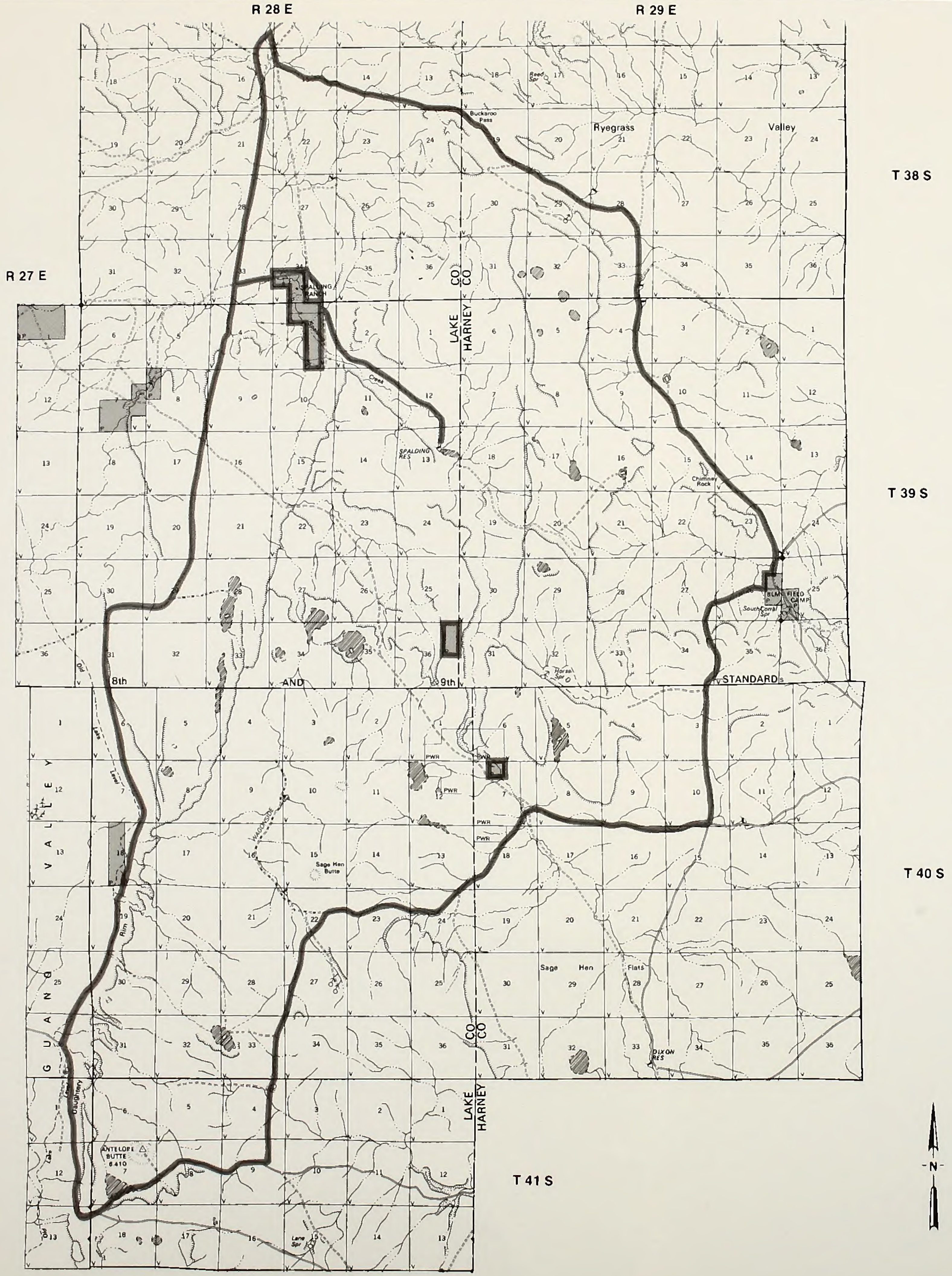
Lakeview District

Spaulding WSA
OR-1-139

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▭ BLM Land in WSA Studied Under Section 603 of FLPMA
- — Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▨ Private

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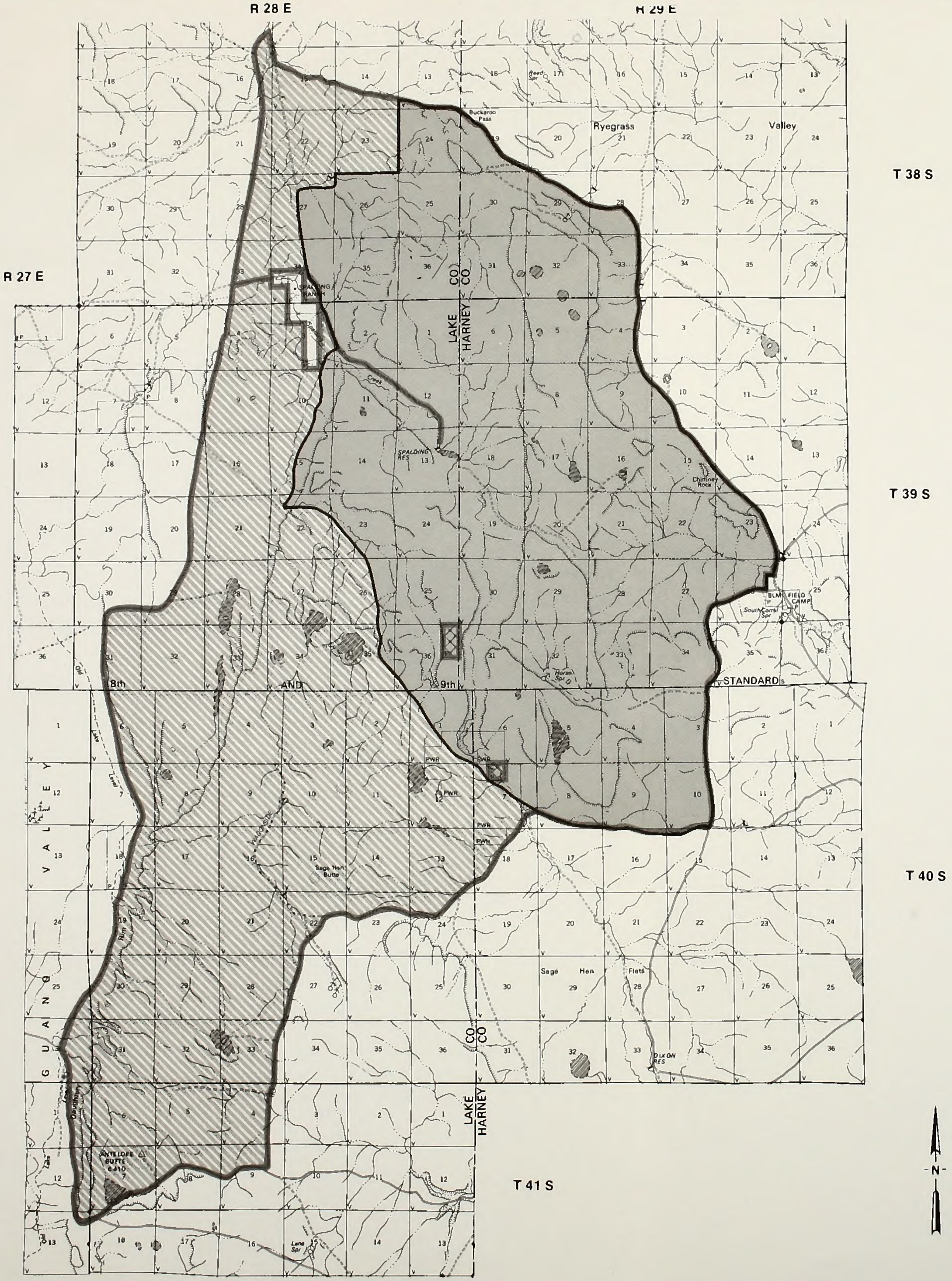
Spaulding WSA
OR 1-139

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



— Wilderness Study Area Boundary

■ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

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Spaulding WSA
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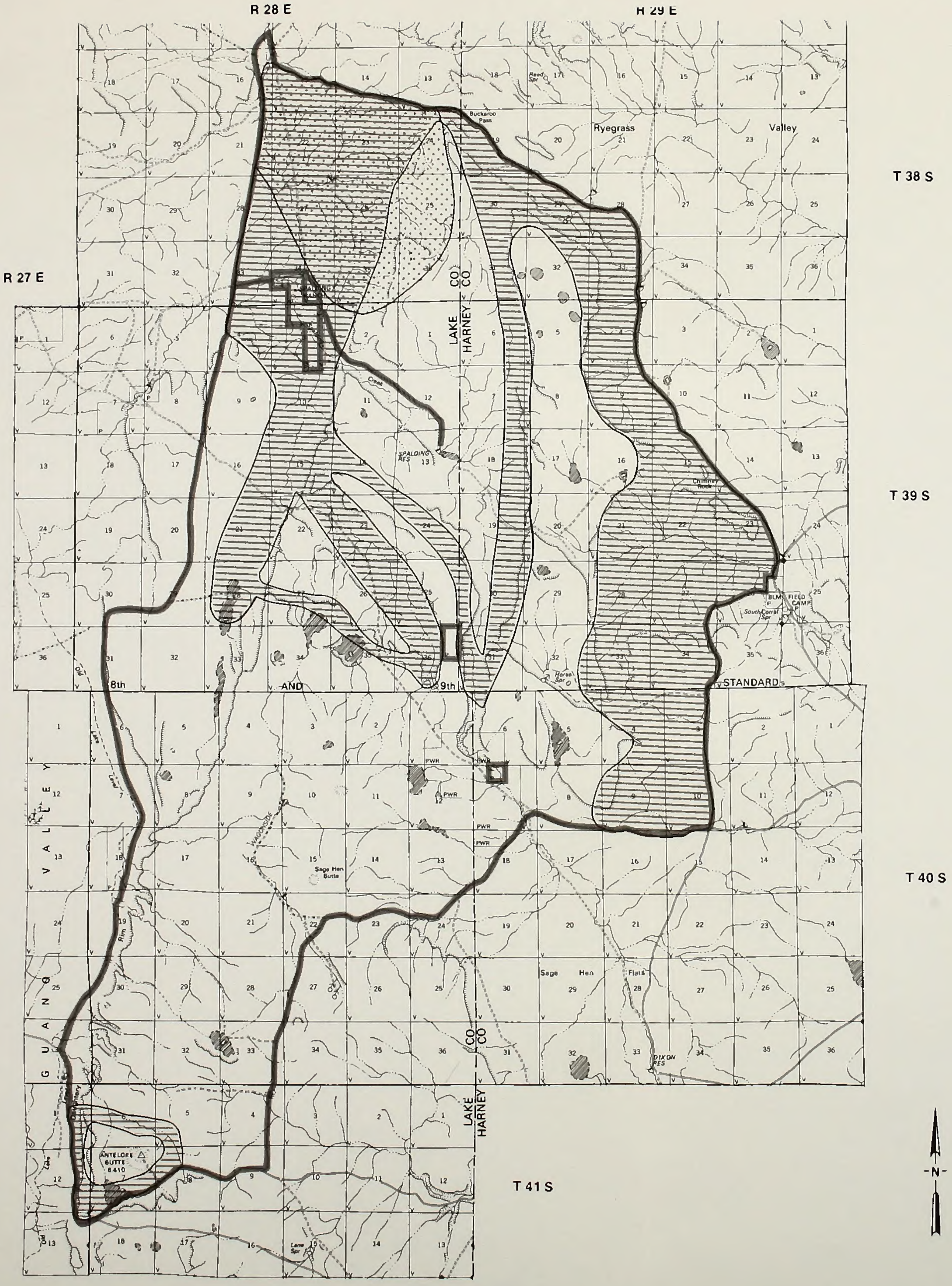
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



Entire WSA:
Moderate Potential
(MB) for Mercury, Gold, Silver
and Bentonite

▤ **Moderate Potential (MB) for Diatomite**

⬚ **High Potential (HD) for Pozzolanic Tuffs**

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Spaulding WSA
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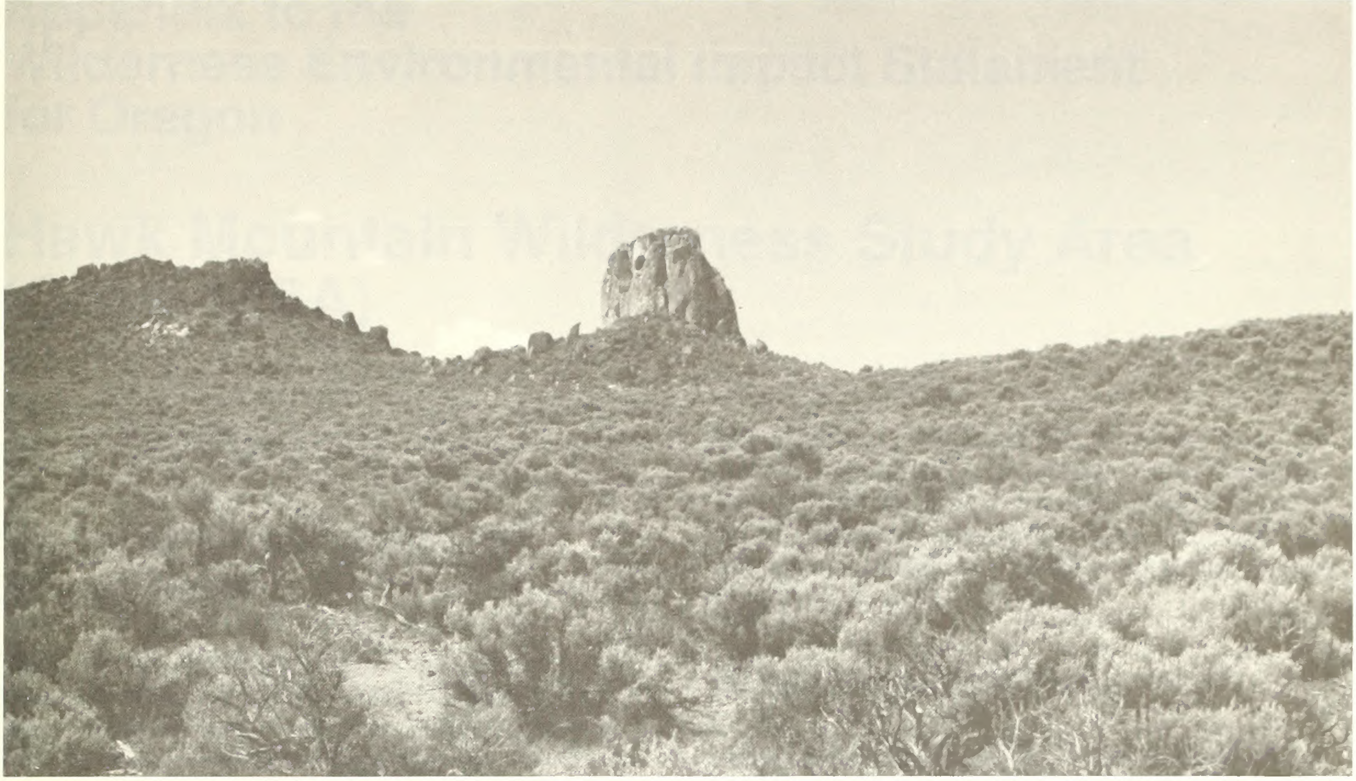
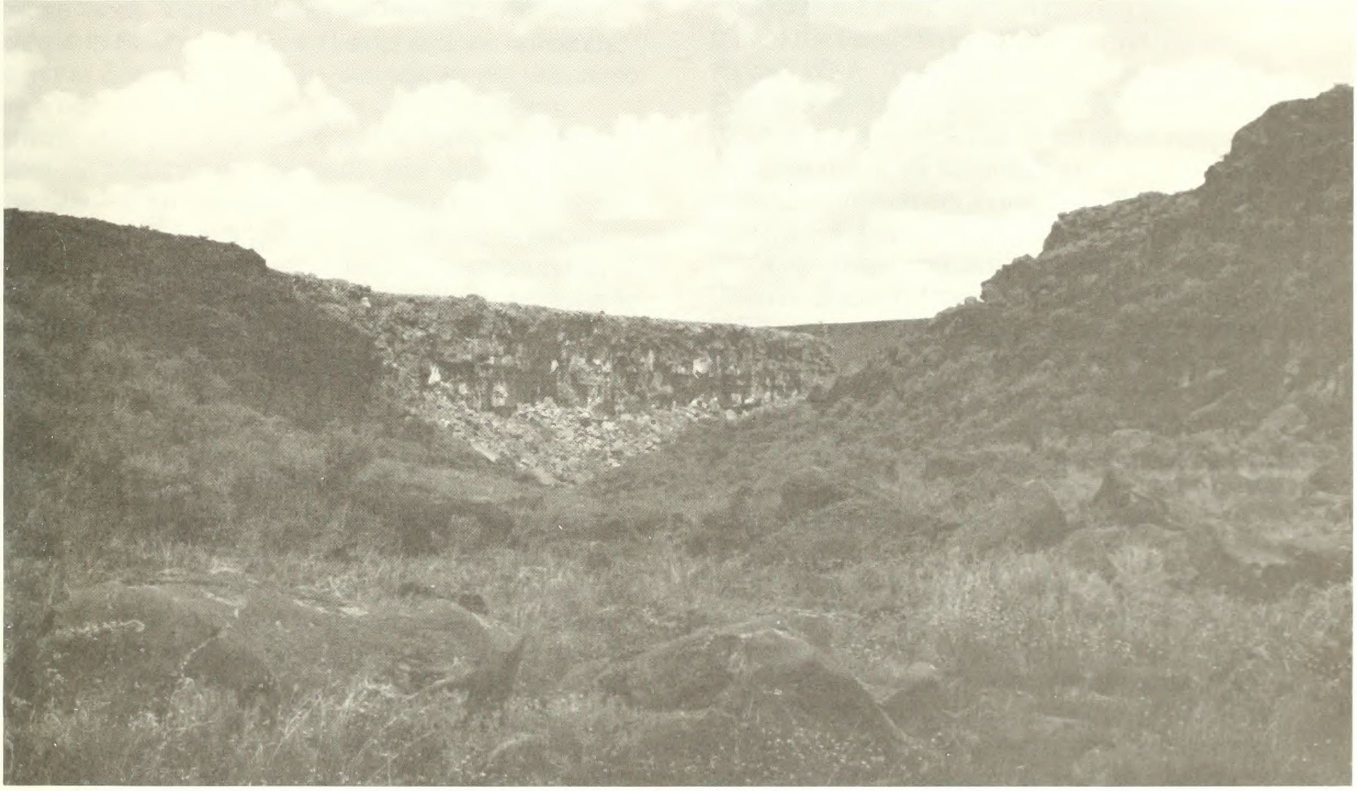
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Spaulding WSA, OR-1-139. Chimney Rock on the east boundary of the WSA. Within the area recommended nonsuitable under the proposed action (no wilderness/no action) and suitable under the partial alternative. August 1980.



Spaulding WSA, OR-1-139. Near the south end of Sagehen Canyon at the "potholes" looking north. Within area recommended nonsuitable under the partial alternative and proposed action (no wilderness/no action). June 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Hawk Mountain Wilderness Study Area (OR-1-146A)

1. Introduction

General Description of Study Area

The Hawk Mountain Wilderness Study Area (WSA) is located in southern Harney County, Oregon, approximately 73 miles east of Lakeview, Oregon (see Map 1). The closest highway is State Highway 140, 5 miles southwest of the WSA.

The study area contains 69,640 acres of public land (see Map 2), including two 640-acre parcels of split-estate lands. Approximately two-thirds of the study area is in BLM's Lakeview District and the remainder is in the Burns District. The boundaries are described by a high standard gravel road on the northwest, private land and a fenceline on the north, low standard dirt roads on the northeast and southwest, and the Charles Sheldon National Wildlife Refuge (fence) on the south. The adjacent lands are public except for some private lands along the northern boundary at Acty Mountain. A dead-end road extends 2.5 miles to a horsetrap near the northwest corner of the WSA. The road and horsetrap site are excluded from the WSA.

The west side of the study area is characterized by rolling sagebrush hills and low, broken rimrock grading eastward toward the lake basin known as Hawksie Walksie. The steeper ridges and peaks of Acty Mountain, Hawk Mountain and Lone Juniper Mountain flank the basin to the north and northeast. To the east are buttes of partially exposed columnar basalt, areas of colorful volcanic soils and stone, and high tablelands incised by rocky draws. Elevation ranges from 5,600 feet in Hawksie Walksie Basin to 7,234 feet at the summit of Hawk Mountain.

Vegetation in the WSA is composed primarily of big sagebrush/bunchgrass communities with low sagebrush flats on the western-most portion and on the high plateaus of the southeast. Mountain shrub communities occupy northern slopes at higher elevations. Tree species are limited to scattered junipers and one grove of mountain mahogany. Some excellent examples of native bunchgrass communities exist in several areas within the WSA.

Interrelationships

Adjoining the Hawk Mountain WSA at the northeast boundary is the Rincon WSA (OR-2-82H) and along the southwest boundary is the Sage Hen Hills WSA (OR-1-146B).

The Pueblo-Lone Mountain grazing allotment contains part of the Hawk Mountain WSA and the adjacent Rincon WSA. The Basque Hills (OR-2-84) and Pueblo Mountains (OR-2-81) WSAs are also within this allotment. Proposals to construct range improvements in the Hawk Mountain WSA are related to grazing management in the other three WSAs. To the south is Big Spring Table Unit (65,600 acres), an administratively-endorsed wilderness proposal on the Charles Sheldon National Wildlife Refuge (Sheldon NWR) in Nevada. The Big Spring Table Unit provides the bulk of the winter range for the interstate antelope herd (portions of which also winter within the Hawk Mountain WSA) during severe winters and is the only area on the Sheldon Range to perform this function. This area is also entirely within a wildlife reserve classification with livestock excluded.

Approximately 300 acres of the 440-acre Long Draw Research Natural Area (RNA) lie within the WSA near its eastern boundary (see Map 2). The remaining portion of the RNA lies within the Rincon WSA. The RNA was designated to protect, for scientific and educational purposes, an excellent Indian ricegrass/needle-and-thread grass community. Another plant species which occurs within the RNA, *Cymopterus purpurascens,* is listed by the Oregon Natural Heritage Data Base as threatened in Oregon, but more common or stable elsewhere. The RNA designation and the protection it affords would continue to apply regardless of whether or not the area is designated wilderness. Two other RNAs are proposed within the WSA.

The Hawk Mountain WSA lies within the East Beatys Butte Wildlife Unit administered by the Oregon Department of Fish and Wildlife (ODFW). Populations of pronghorn antelope varying from 20 to 1,000, and as many as 40 mule deer, are supported by the WSA. The ODFW goal for mule deer herd numbers in the 2,507-square-mile Beatys Butte unit is 1,800 adult animals. No goal has been set for antelope herd numbers or for sage grouse populations. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

The western half of the study area is in the Beatys Butte wild horse herd management area (HMA), the management of which will not be significantly affected by any of the alternatives.

Harney County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for analysis in the Hawk Mountain WSA include:

- impact on wilderness values,
- impact on antelope, mule deer, sage grouse, Swainson's and ferruginous hawks and other wildlife populations,
- impact on recreation use levels,
- impact on energy and mineral development, and
- impact on distinctive plants and plant communities.
- impact on livestock grazing use levels and management,

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site-specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness (Proposed Action)
- partial
- no wilderness/no action

An enhanced wilderness alternative which would combine the Hawk Mountain WSA with the Rincon WSA and/or the Sage Hen Hills WSA by closing roads between the WSAs is not analyzed because of the importance of keeping the roads open for livestock management activities and for public access. Acquisition of mineral estate of split-estate lands is not analyzed under a separate enhanced alternative, since the effects of such an alternative would not differ substantially from those analyzed in the all wilderness alternative.

All Wilderness (Proposed Action)

The all wilderness alternative would recommend all 69,640 acres of public land in the WSA suitable as wilderness (see Map 2). For purposes of analysis, this alternative assumes the mineral estate of the split-estate lands would not be acquired, and the 2.5 mile dead-end road into the horsetrap near the northwest border of the WSA would remain open.

Energy and Mineral Development Actions

The all wilderness alternative would withdraw 68,360 acres from all appropriations under mining and mineral leasing laws. The 1,280 acres of split-estate land would remain open to energy and mineral entry.

Wildlife Habitat Management Actions

Wildlife habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy. The primary manner in which wildlife habitat is managed is by close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Livestock Management Actions

Livestock use would remain at the current use level of 3,994 AUMs within the portions of the two allotments in the WSA. The primary season of use for the Beatys Butte allotment is April 15 to December 15 and from April 16 to October 31 for the Pueblo-Lone Mountain allotment. See Table 4. Livestock management activities including maintenance of 6 miles of fence would be accomplished by horseback. Mechanized heavy equipment would be used on 2.5 miles of existing once every 5 to 10 years to maintain three waterholes. With these exceptions, 25 miles of way would be closed to livestock management activities.

Recreation Management Actions

The entire 69,640 acres would be closed to motorized vehicle use, affecting 25 miles of ways within the study area. The 2.5 mile dead-end road to the horsetrap would remain open. Current recreational use is estimated to be approximately 200 visitor days per year.

Partial

The partial alternative would recommend 42,280 acres in the eastern part of the WSA suitable as wilderness (see Map 3). In addition, the mineral estate of the 1,280 acres of split-estate land would be acquired through purchase or exchange with willing owners. The western boundary of the portion recommended suitable would be formed by the 2.5 mile dead-end road into the horsetrap and the way past Rastus Waterhole above the north end of Hawksie Walksie lakebed. The boundary would then follow the eastern edge of the Hawksie Walksie Basin south to the way along the north end of Big Spring Table and then south to the Nevada border.

Under this alternative, 27,360 acres would be recommended nonsuitable as wilderness and wilderness values in this area would not receive special legislative protection. The low, rolling hills in the western portion of the WSA and Hawksie Walksie lakebed are included in this acreage.

Energy and Mineral Development Actions

Under the partial alternative, 42,280 acres (assuming acquisition of the mineral estate of split-estate lands) would be withdrawn from all appropriations under mining and mineral leasing laws.

All of the 27,360 acres recommended nonsuitable, including 27,360 acres with moderate potential for the occurrence of gold, silver, mercury and copper, would be open to energy and mineral exploration. Also within the nonsuitable area are 17,280 acres with moderate potential areas for diatomite. Casual exploration for oil, gas, geothermal resources, and diatomite sources is anticipated, but no development of these resources is expected due to the ready accessibility of these resources in areas outside the WSA and to market conditions. Exploration for gold is projected to result in one open-pit mine directly impacting 160 acres and requiring development of 3 miles of road.

Wildlife Management Actions

Wildlife habitat for all species would be preserved on the 42,280 acres recommended suitable as wilderness and managed in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy. The primary manner in which habitat is managed is by close coordination with the livestock allotment management plan goals to ensure sufficient forage for wildlife.

Approximately 920 acres would be burned and seeded with crested wheatgrass to improve forage for deer and antelope in the portion recommended nonsuitable.

Livestock Management Actions

Livestock use would remain at the current level of 3,970 AUMs within the WSA. The season of use would remain as identified in Table 4. Vehicle use would be precluded on 19 miles of ways. Four miles of fence would be maintained using horses. Heavy equipment for waterhole and reservoir maintenance would occur on 2.5 miles of existing ways every 5 to 10 years.

Two proposed reservoirs would be constructed on the acreage recommended nonsuitable, thereby improving livestock distribution in the western portion of the study area. Reservoir construction would involve approximately five acres of surface disturbance for each.

Recreation Management Actions

Nineteen miles of ways would be closed to vehicle use, and 42,280 acres would be closed to off-road motorized travel. The remaining 27,360 acres, including 6 miles of ways, would be open to vehicles. Current recreation use level is approximately 200 visitor days per year.

No Wilderness/No Action

This alternative would recommend the entire 69,640 acres nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire 69,640 acres of the Hawk Mountain WSA would be open to energy and mineral exploration and development. The WSA has moderate potential for the occurrence of geothermal resources and for bentonite and diatomite. Only casual exploration for these resources is expected, with no development anticipated due to the ready availability of this resource elsewhere and to market conditions.

The potential for occurrence of gold, silver, mercury and copper is moderate. Exploration is expected, especially for gold, followed by development of one open-pit mine directly affecting 160 acres and construction of 6 miles of road.

Wildlife Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW goals. The primary manner in which habitat is managed is through close coordination with the livestock allotment management plan goals to ensure sufficient forage for wildlife.

Forage conditions for deer and antelope would be improved by vegetative manipulation totaling 1,665 acres. One project involves the burning and seeding with crested wheatgrass of two parcels (totaling 1,230 acres) located in the hills both to the east and to the west of Hawksie Walksie Basin. The purpose of these two seedings would primarily be to improve livestock forage, but deer and antelope would receive some benefit. About 435 acres southwest of this basin are proposed for similar treatment to benefit antelope. These projects would improve forage conditions but would not substantially alter herd numbers.

Livestock Management Actions

Licensed livestock use would increase from the current 3,994 AUMs by 440 AUMs following the implementation of two burn-and-seed treatments on 1,665 acres just east of the Hawksie Walksie Basin designed specifically to provide forage for livestock. The season of use would remain as identified in Table 4.

Three reservoirs in the western portion of the study area and one reservoir east of Hawksie Walksie Basin would be constructed under a no wilderness action. Two pipelines totaling 9 miles would also be constructed along the eastern WSA boundary at Long Draw. These pipelines are part of a total allotment plan to shift livestock use from heavily-grazed to lightly-grazed areas by distributing water. Surface disturbance for all projects would total approximately 1,725 acres. All 25 miles of ways would remain open to vehicle use.

Recreation Management Actions

The entire 69,640 acres, including 25 miles of ways, would be open to vehicle use, except for the 300 acres of the Long Draw RNA located within the WSA. Current recreation use level is approximately 200 visitor days per year.

Summary

Table 1 summarizes the projected management actions of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Hawk Mountain WSA is in a very natural condition, as are the areas immediately surrounding it (with the exception of a seeding to the north). The quantity of native bunchgrass throughout the entire area and the quality and diversity of these bunchgrass communities are exceptional.

Unnatural features are few and scattered. There are five small reservoirs and waterholes and 6 miles of fence separating the Lakeview and Burns BLM Districts and one fenced spring exclosure in the northeast. Twenty-five miles of vehicle ways, many of which are revegetating to native bunchgrasses and shrubs and are difficult to locate on the ground, are also within the WSA. Three of the waterholes are noticeable only in their immediate vicinity; the two waterholes in Hawksie Walksie Basin are visible from a greater distance because they are located in a large, open playa within view of the surrounding hills. In a narrow draw in the north are two concrete water storage tanks, a dry waterhole and a presently unused pipeline which originates on private land on the north slope of Acty Mountain. One spring in the northwest portion of the WSA has been minimally developed and fenced for wildlife. The area influenced by these developments is less than 770 acres, or 1.5 percent of the WSA.

Opportunities for Solitude or Primitive and Unconfined Recreation

The opportunity for solitude is outstanding throughout the entire study area. The north, northeast and eastern portions of the WSA have mountainous terrain with draws, valleys, ridges and canyons among which one can easily isolate oneself. The far western portion has less dramatic topography but still offers the visitor ample solitude due to its large area, its sinks, draws and low rimrock. The lakebed, although flat and open, engenders a feeling of isolation because hills, mountains and plateaus surround and enclose it.

There are outstanding opportunities for a wide range of primitive recreation activities including day hiking, backpacking, horseback riding, hunting and camping. The eastern half of the WSA offers the more rugged and challenging hiking terrain, while the central and western portions offer the most opportunities for wildlife observation.

Sightseeing and photographic opportunities are present throughout. The WSA offers a diversity of form and content representative of much of the high desert country, including alkali flats, sagebrush communities, badlands and high desert peaks. Wild horses are common, as are antelope, deer, raptors, small birds and mammals. Views from higher terrain are expansive and often dramatic. Two areas on the east side in Long Draw contain unique rock formations, and there are also three balanced rocks atop a colorful, eroded sedimentary deposit in one of the more remote draws.

Primitive hunting opportunities for antelope are good. The WSA is particularly suited to hunting by horseback due to its large size and lack of roads.

Special Features

The Long Draw area, located along the eastern border of the WSA, contains a number of special features. One such feature is the scenic contrast in color of exposed soils and the various types of vegetation on the hills flanking the draw. Buck Buttes on the north flank of the draw has exposed columnar basalt on which are several raptor nests. Some very unusual eroded pinnacles occur in a small draw between the two buttes. The Long Draw Research Natural Area includes two uncommon plant communities (big sagebrush/needle-and-thread grass/Indian ricegrass and winterfat) and a plant species which is threatened in Oregon, *Cymopterus purpurascens*.

Two other acreages within the WSA are being considered for RNA status because of their unusual plant assemblages and excellent productivity and condition of their plant communities. See Vegetation Section under Affected Environment.

The study area contains a migration corridor, winter range and kidding grounds for pronghorn antelope. It also contains nesting and feeding habitat for Swainson's and ferruginous hawks, as well as for other raptors, habitat for cougar, and sage grouse habitat including an undetermined number of strutting grounds. The ephemeral lake in Hawksie Walksie Basin provides a resting area for migratory waterfowl each spring. See Wildlife Section under Affected Environment.

Significant cultural resources including a large lithic manufacture site have also been located within the WSA.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Hawk Mountain WSA is in the Intermountain Sagebrush Province, with a potential natural vegetation of sagebrush steppe.

Vegetative communities listed in the Basin and Range section of the Oregon Natural Heritage Plan and occurring in the study area are: big sagebrush/Idaho fescue, big sagebrush/bluebunch wheatgrass, low sagebrush Idaho fescue, low sagebrush/Sandberg's bluegrass, silver sagebrush, black sagebrush, bare playa and playa margins communities, winterfat, mountain mahogany in southern basin and range, bitterbrush-sagebrush/snowberry, and Indian ricegrass-needlegrass. Two other native communities not included in the Natural Heritage Plan are big sagebrush/creeping wildrye grass and big sagebrush/Thurber's needlegrass.

Hawk Mountain WSA is located within five hours' driving time of three standard metropolitan statistical areas with populations over 100,000: Medford, Oregon; Boise, Idaho; and Reno, Nevada.

Energy and Mineral Development

Energy and mineral resources were evaluated by BLM using available geologic data and information provided in a report by TERRADATA, a consulting firm under BLM contract. The report is titled "Assessment of Geology, Energy, and Minerals Resources of the Lone Mountain Geologic Resource Area." Additional information from a l988 U.S. Bureau of Mines Report entitled "Mineral Resources of the Hawk Mountain Wilderness Study Area, Harney County, Oregon" has also been incorporated into this analysis.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (certainty level). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the mineral potential classification for the WSA. Map 4 shows the portions of the WSA with moderate potential for the occurrence of metals, geothermal, bentonite and diatomite.

The surface rocks of the WSA consist of Tertiary and Tertiary to Quaternary flows, breccias, tuffs, and tuffaceous sediments, and Quaternary unconsolidated alluvium and playa deposits. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may occur at depth.

Energy Resources

Based on indirect evidence, 3,800 acres are considered to have a moderate potential for the occurrence of geothermal resources. The geologic potential for the occurrence of other energy resources is considered to be low (oil, gas, coal) or generally lacking (uranium, thorium).

As of October 16, 1987, there were no leases for energy resources inside the WSA.

Mineral Resources

Based on indirect evidence the entire WSA in considered to have moderate potential for the occurrence of gold, silver, mercury and copper. Parts of the WSA are moderately favorable for the occurrence of bentonite (600 acres) and diatomite (24,000 acres).

As of October 16, 1987, there were no mining claims within the WSA.

Soils

The west half of the WSA is characterized by flat to gently sloping uplands with shallow, clayey, very stoney, and well-drained soils.

The Hawksie Walksie basin area contains soils ranging from silty, well-drained soils underlain by consolidated lake sediments to shallow, excessively drained soils underlain by hardpan.

The mountain tops of Acty and Hawk Mountains are steeply sloping with shallow, very stoney soils interspersed with rock outcrops. Below the peaks are cobbly, moderately deep soils high in organic matter.

Soils in Long Draw and to the east slope of Acty, Hawk and Lone Juniper Mountains are coarse-textured, shallow to moderately deep soils over tuffaceous parent material. The soils in Long Draw are highly erodible where tuffaceous parent material is exposed and moderately erodible in the rest of Long Draw due to the slope.

Evidence of severe erosion exists along the east boundary road in Long Draw and on exposed tuffaceous outcrops.

Vegetation

Vegetation in the Hawk Mountain WSA is composed mainly of sagebrush/bunchgrass communities. The area contains a wide diversity of communities in natural condition (refer also to the preceding section, Diversity in the NWPS). Most of the vegetative communities are in a mid- to late-seral stage. Low sagebrush communities predominate in the extreme western portion of the WSA while big sagebrush/bunchgrass communities are dominant in most of the rest of the area.

A variety of native bunchgrasses grows in the sagebrush communities on the hills and in the valleys of the study area, including bluebunch wheatgrass, Thurber's needlegrass, June-grass, Sandberg's bluegrass, Idaho fescue and squirreltail grass. Silver sagebrush is found in Hawksie Walksie Basin area with squirreltail grass and creeping wildrye. Tree species consist of juniper, which are sparsely scattered throughout the study area, and mountain mahogany, which are restricted to a single grove in the northwest. In the canyons and rimrock are such shrubs as wax currant, gland ocean-spray, snowberry, bitterbrush, serviceberry and Wood's rose.

Two uncommon vegetative communities occur in the Long Draw vicinity in the eastern portion of the WSA: big sagebrush/needle-and-thread grass/Indian ricegrass, and winterfat. Three hundred acres of the 440-acre Long Draw Research Natural Area for the protection and study of the ricegrass/needle-and-thread grass community lie within the WSA. This community is in good condition, having received little livestock use. *Cymopterus purpurascens,* a plant species considered threatened in Oregon (although more common or stable elsewhere), also occurs within the RNA.

A Wyoming big sagebrush/Thurber's needlegrass community in the southwestern portion of the WSA and an unusual plant assemblage on the southwest slope of Hawk Mountain are both being considered by the Pacific Northwest Research Natural Area Committee and BLM as potential RNAs. The former is the best representation of this community type in the Lakeview District. The latter is of special interest because the variety, condition and productivity of the plant communities making up the assemblage are excellent. It is considered to be a unique vegetative assemblage in eastern Oregon and Washington.

The eastern end of the WSA has numerous outcrops of exposed light-colored soils where a wide variety of plant species grow in a very colorful display. Some of these plants include winterfat, purple sage, line-leaf fleabane, balsamroot, slenderbush buckwheat, dwarf monkey-flower and Bruneau mariposa lily.

Wildlife

Pronghorn antelope are common in the study area and an antelope kidding ground is in an area west of the Hawksie Walksie Basin. Approximately 20 individuals regularly use the WSA during the summer, and up to 1,000 may congregate within the WSA boundaries during the winter. Herd condition is generally good. Mule deer, also in good condition, number up to 40.

Sage grouse, a candidate for Federal listing as threatened and endangered species, inhabit the area in undetermined numbers. Strutting grounds are believed to occur within the WSA boundaries, but none have as yet been identified.

A pair of Swainson's hawks, a candidate species for Federal threatened and endangered status, nested in the northwest portion of the WSA in 1987. Three offspring were successfully fledged from the nest. In 1988 a pair of ferruginous hawks, also candidate species for Federal listing as threatened and endangered, successfully fledged two offspring from the same nest.

Cliffs of columnar basalt also offer nesting sites for raptors in the eastern portion of the WSA.

The ephemeral lake formed in the Hawksie Walksie Basin from the melting of winter snow provides resting and feeding habitat for migratory waterfowl each spring.

Jackrabbit, cottontail, coyote, marmot, various species of ground squirrel, burrowing owl, rattlesnakes, horned toad, red-tailed hawk, prairie falcon, loggerhead shrike, mourning dove, sage sparrow and other perching birds are some of the other common, more visible species within the study area. Other wildlife species which inhabit or frequent the area include weasel, badger, striped skunk, bobcat, cougar, golden eagle, raven, rubber boa, Canada geese, mallard, avocet, green-tailed towhee and chukar. The historical range of the kit fox also extends into the study area, although none of this species have been sighted here for a number of years.

One spring in the northwest portion of the WSA has been minimally developed and fenced for wildlife.

Watershed

There are no perennial streams or springs in the study area.

Livestock Grazing

Portions of two grazing allotments are within the WSA. Table 4 shows existing and potential livestock use in AUMs. Existing livestock developments include 5 reservoirs and waterholes, 6 miles of fence, 1+pipeline, and 2 water storage tanks.

Three trips per year by vehicle on 10 miles of way are necessary for the salting and checking of livestock. Maintenance of three waterholes requires heavy equipment every 5 to 10 years. Access is by 2.5 miles of existing way. Other livestock management activities are accomplished by horseback.

Preliminary and inconclusive data show that grazing in portions of the Pueblo-Lone Mountain allotment, including portions of the Pueblo Mountains and Rincon WSAs, are receiving heavy utilization while other portions of the allotment are not grazed regularly due to lack of water and fences to keep livestock confined to those areas. Preliminary estimates concerning grazing are subject to refinement based on monitoring data.

Recreation Use

Primitive types of recreation in the WSA include horseback riding, hunting, hiking, camping, nature study and photography. Vehicle-oriented recreation is primarily related to antelope and deer hunting. Hunter camps are commonly established at Rastus waterhole and near the southeast corner of the Hawksie Walksie lakebed. Overall recreation use is estimated to be approximately 200 visitor days per year.

Local Personal Income

Livestock use at the current level of 3,970 AUMs and recreation use totaling 200 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $47,640 for livestock grazing and $2,400 related to recreation use of the WSA, for an overall total of $50,040. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in the Hawk Mountain WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness (Proposed Action)

Recommended suitable for wilderness: 69,640 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The all wilderness alternative would add 69,640 acres of public land in the WSA to the NWPS, and wilderness values of naturalness, solitude, and primitive and unconfined recreation would be protected by legislative mandate. Special features, including antelope, sage grouse and Swainson's hawk habitat, native grasslands, cultural resources and scenic values, would be retained.

Naturalness

The naturalness of this large, remote WSA would be preserved and enhanced by prohibiting motorized use on 25 miles of ways, which visually influence 770 acres. The 25 acres disturbed by these ways would revegetate within 5 to 10 years, eliminating impacts to naturalness on 770 acres. The limited use of heavy equipment on 2.5 miles of ways for the maintenance of waterholes and reservoirs once every 5 to 10 years would not prevent revegetation of the ways.

Off-road motorized travel within the 69,640 acres would also be precluded, preserving the natural vegetation in the areas where this type of activity would increase without wilderness protection.

Solitude

Opportunities for solitude would improve through the elimination of vehicles on 25 miles of ways, 13 of which are within the open basin area where vehicle use would be highly visible from surrounding elevations. Vehicles would be limited to the boundary roads and to the 2.5 mile dead-end road to the horsetrap. The elimination of vehicle use would provide a large core area where solitude could be experienced without disturbances from vehicle use.

Primitive and Unconfined Recreation

Closure of the 69,640-acre WSA to motorized traffic would increase opportunities for primitive types of recreation such as hiking, backpacking, hunting and birdwatching. Photography and sightseeing experiences would also improve with the elimination of vehicle access and the rehabilitation of the 25 miles of ways. The area's wild, primitive natural setting would improve with revegetation of the ways.

Special Features

Under the all wilderness alternative, the special features of wildlife and vegetation in the WSA would not be subject to surface-disturbing activities associated with livestock management activities and recreational vehicle travel. Sage grouse habitat would be protected from vegetative manipulation projects and mineral development. The closure of ways to vehicles and the prohibitition of mineral development would prevent disturbance to nesting Swainson's and ferruginous hawks. Likewise, antelope would not be subject to disturbance by vehicles and mining activities, particularly with respect to the kidding grounds in the western portion of the WSA.

Native vegetation would be preserved through the exclusion of surface disturbing activities. Sage grouse habitat would be maintained as well.

Conclusion: Wilderness designation of the Hawk Mountain WSA would result in protection and enhancement of existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation under this alternative would withdraw 68,360 acres from all appropriations under mining and mineral leasing laws. Remaining open for energy and mineral exploration and development would be 1,280 acres of split-estate land.

Energy Development

Exploration for geothermal resources, which have a moderate potential for occurrence based upon indirect evidence, would be precluded on 68,360 acres. Casual exploration could occur on the 1,280 acres of split-estate lands. Due to the lack of geologic evidence to justify an extensive exploration/development program, development is not expected.

Conclusion: No impact to energy development is expected.

Mineral Development

Based on indirect evidence, there is moderate potential for the occurrence of mercury, copper, silver and gold on 68,360 acres which would be closed to mineral entry under this alternative. Casual exploration for gold is expected. Development of one open-pit mine would be foregone.

Approximately 24,000 acres rated moderate for diatomite and 600 acres rated moderate for bentonite would also be closed. Due to the ready availability of these two commodities in areas outside the WSA, and due to present market conditions, only casual exploration, without development, is expected.

Conclusion: Development of one open-pit gold mine would be foregone within the 68,360 closed to mineral entry.

Impacts on Soils

An all wilderness action would preclude construction of a pipeline in the eastern portion of the WSA where increased livestock presence would lead to erosion of fragile volcanic soils.

The development of an open-pit mine would be precluded along with direct impacts to soils over 160 acres and on an additional 3 acres for access.

Conclusion: Wilderness designation of the entire WSA would protect fragile soils in the eastern portion from increased numbers of livestock and surface disturbance.

Impacts on Vegetation

The elimination of vehicle use would prevent continued surface disturbance along 25 miles of vehicle ways, allowing for their revegetation in 5 to 10 years. Native vegetation would be protected from off-road vehicle travel. The Long Draw RNA would continue to receive special protection for its unique bunchgrass community.

Mineral development which would remove vegetation from 163 acres would be precluded.

Conclusion: The present natural vegetation which occurs throughout most the WSA would be preserved under this alternative. Twenty-five miles (25 acres) of ways would revegetate.

Impacts on Wildlife

Habitat for all wildlife species would be preserved and the complex ecological balance of this relatively undisturbed area would be protected under an all wilderness action. Wildlife habitat for the 1,000 antelope and 40 mule deer, for sage grouse, raptors and other nongame species would be maintained under wilderness designation. Cougar would benefit from the undisturbed environment preserved as wilderness, as this species is particularly identified with a wild, natural habitat. Adequate wildlife forage would be ensured in the preparation of livestock allotment management management plan goals.

Closure of 25 miles of ways and prohibition of mineral development on 68,360 acres would enhance habitat for antelope by preventing disturbance by vehicles and mining activities, especially in the vicinity of the kidding grounds west of Hawksie Walksie Basin. Raptor nesting habitat, sage grouse, and other ground-nesting species would likewise benefit by the closure of the area to mining activities and 25 miles of way to vehicle use.

Conclusion: Wildlife habitat and populations would be maintained on 68,360 acres designated wilderness.

Impacts on Livestock Grazing

Under the all wilderness alternative, proposed burn-and-seed projects totaling 1,665 acres would be foregone. The opportunity to increase livestock forage by 440 AUMs in the Beatys Butte allotment would be foregone. Four proposed reservoirs and two pipelines would not be constructed, limiting the ability to redistribute water and livestock use within the Beatys Butte allotment.

Vehicle use for day-to-day livestock management on 25 miles of ways would be precluded with minor inconvenience to livestock operators. Much of the checking of livestock is currently accomplished by horseback. Heavy equipment access would occur every 5 to 10 years for maintenance of three waterholes. This periodic, infrequent use would involve 2.5 miles of ways. There would be no significant impact on existing livestock use.

Conclusion: The opportunity to increase forage by 440 AUMs and to improve livestock distribution would be foregone. Vehicle use of 25 miles of ways would be eliminated, resulting in some inconvenience to livestock operators.

Impacts on Recreation Use

The entire 69,640 acres would be closed to recreational vehicle travel. The 2.5 mile dead-end road into the horsetrap would remain open. Ten visitor days per year of vehicle-oriented hunting would be displaced to areas outside the WSA by the closure of 25 miles of ways within the WSA.

The quality and esthetic values of primitive recreation would be enhanced under this alternative due to the elimination of noise and visual disturbance associated with vehicle use. This would be especially true in the open playa central to the WSA where vehicle use would be visible from the surrounding hills, mountains and plateaus. The primitive hunting experience would be enhanced because game would not be scattered by vehicles within the WSA and a primitive setting would be maintained. Primitive recreation use would be expected to increase from 200 to 220 visitor days per year.

Conclusion: The overall recreational use of the area would be expected to increase from 200 to 220 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 3,994 AUMs. Overall recreation use would increase by approximately 20 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $240 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $240.

Partial

Recommended suitable for wilderness: 42,280 acres
Recommended nonsuitable for wilderness: 27,360 acres

Impacts on Wilderness Values

Under this alternative, 42,280 acres would be designated wilderness, and the wilderness values of naturalness, opportunities for solitude and primitive and unconfined recreation, and the special features would be protected within this acreage by legislative mandate.

Wilderness values on the remaining 27,360 acres would not receive special legislative protection, and these values would be impacted by projected management actions.

Naturalness

Naturalness would be enhanced in the portion recommended suitable as wilderness by the elimination of motorized vehicles on 19 miles of ways. The closure of these ways would allow for revegetation of 19 acres in 5 to 10 years, removing their influence from 520 acres.

In the portion recommended nonsuitable as wilderness, naturalness would be altered by an open pit gold mine on 160 acres, 3 miles of minerals exploration roads, a burn-and-seed treatment of 920 acres, and construction of two reservoirs. These developments would visually affect about 3,100 acres. Continued vehicle traffic on 6 miles of ways (visually affecting 250 acres) and by off-road vehicle travel. A short-term visual impact associated with the burn-and-seed would also indirectly affect 4,000 acres.

Solitude

The excellent opportunities for solitude afforded by the hills, canyons, draws, and other topographic features in the portion of the WSA recommended suitable as wilderness east of Acty Mountain and the Hawksie Walksie Basin would be preserved and enhanced under this alternative by the elimination of vehicle disturbances.

Opportunities for solitude would be reduced in the portion recommended nonsuitable as wilderness by continued vehicle use of 6 miles of ways, visually influencing 250 acres, construction and use of 3 miles of new road, mining activity, construction of reservoirs, and by off-road vehicle use.

Opportunities for Primitive and Unconfined Recreation

Restriction of vehicle travel within the portion recommended suitable would enhance opportunities for primitive and unconfined recreation locally by the restriction or elimination of vehicles on 19 miles of ways. The visual impact of these ways affects approximately 520 acres. Revegetation would enhance the quality of primitive recreation activities by improving the primitive natural setting.

On the 27,360 acres recommended nonsuitable, these same opportunities would be reduced by mineral development, continued vehicle access, and livestock management activities.

Special Features

A majority of the native bunchgrass communities, wildlife habitat and the scenic qualities in the eastern portion of the study area would be preserved under this alternative by the elimination of vehicle use which would disturb wildlife and visually intrude upon the scenic views. Precluding the shift of increased numbers of livestock into vegetative communities previously ungrazed or lightly grazed would also preserve natural plant communities.

The antelope migration corridor and kidding grounds, much of the sage grouse habitat, and the Swainison's hawk nesting site in the nonsuitable portion would be subject to disturbance from vehicles on 6 miles of ways and 3 miles of road. The ways pass near enough to the kidding grounds and raptor nesting site to affect them by noise and visual disturbance. Natural vegetative communities in the western portion of the WSA would not receive special protection and would be subject to livestock and wildlife development projects altering vegetation on 930 acres. The visual impact of these projects would affect 4,000 acres.

Development of an open-pit mine in the nonsuitable portion would remove 163 acres of vegetation and reduce wildlife habitat.

Conclusion: The partial wilderness alternative would preserve and enhance wilderness values on 42,280 acres. Wilderness values on the 27,360 acres not recommended suitable as wilderness would be degraded on 1,103 acres directly and on over 3,100 acres indirectly by projected activities, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Under this alternative, 42,280 acres (assuming acquisition of 1,280 acres of mineral estate of split-estate lands) would be withdrawn from all appropriations under mining and mineral leasing laws. A total of 27,360 acres would remain open to energy and mineral exploration and development.

Energy Development

Exploration and development of geothermal resources in the portion recommended suitable as wilderness (42,280 acres) would be precluded under this alternative. The 3,800 acres with moderate potential for the occurrence of geothermal resources are within this portion of the WSA. Due to the absence of leases, the location of the WSA, and the similar potential for this resource over large areas outside of the WSA in eastern Oregon, only casual exploration without development is expected. The 27,360 acres recommended nonsuitable as wilderness would remain open to energy exploration and development.

Conclusion: No impact to energy development is expected.

Mineral Development

The partial alternative would close 42,280 acres (assuming the acquisition of mineral estate of split-estate lands) to mineral entry. All of this acreage is rated moderate for the occurrence of mercury, copper, gold and silver; 17,280 acres are rated moderate for diatomite, and 600 acres are rated moderate for bentonite. All of these ratings for the potential for occurrence are based on indirect evidence.

The nonsuitable portion, 27,360 acres, would remain open for mineral exploration and development. All of this acreage has a moderate potential for the occurrence of gold, silver, mercury and copper. Exploration for gold and development of one open-pit mine of 160 acres and 3 miles of road are expected. There is also a moderate potential for the occurrence of diatomite on 6,720 acres in this portion. Casual exploration is anticipated, but development is not expected due to the availability of more accessible sources for these resources.

Conclusion: One open-pit gold mine and 3 miles of road would be developed on 160 acres.

Impact on Soils

Erodible soils in the Hawk Mountain WSA would be protected from disturbance resulting from the construction of 9 miles of pipeline and the increased number of cattle that would result from the availability of water. Most of the fragile volcanic soils of special interest are located within this eastern half of the WSA.

In the nonsuitable portion, construction of two reservoirs would disturb soils on approximately 20 acres and mining activities would disturb about 163 acres.

Conclusion: Fragile volcanic soils in the eastern portion of the WSA would receive protection from disturbances, while soils in the nonsuitable western half would be subject to disturbance on 183 acres.

Impacts on Vegetation

Existing vegetation on the 42,280 acres recommended suitable as wilderness would be preserved and protected. Restriction of vehicle use on 19 miles of ways would allow for revegetation of 19 acres.

In the nonsuitable portion, a proposed burn-and-seed treatment would reduce vegetative diversity and composition on 920 acres by eliminating shrubs and forbs and converting native vegetation to non-native crested wheatgrass. Water developments would also disturb vegetation on 20 acres during construction and would result in a more grazed appearance and less residual ground cover on the approximately 40 acres immediately surrounding the developments.

Mineral development of one open pit mine in the nonsuitable portion would remove vegetation from 160 acres and from an additional 3 acres to provide access.

Conclusion: In the suitable portion of the WSA, I9 miles of ways would revegetate with little or no change elsewhere. A total of 1,143 acres in the nonsuitable portion would be adversely affected by projected actions.

Impacts on Wildlife

Wildlife habitat for all species, including the raptor nesting sites on cliffs of columnar basalt, would be preserved on the 42,280 acres recommended suitable for wilderness. Sage grouse habitat, habitat for 1,000 antelope and 40 mule deer would be maintained under wilderness designation. Adequate wildlife forage would be ensured in the preparation of livestock allotment management plan goals. Closure of the 19 miles of ways would reduce disturbance to antelope.

In the nonsuitable portion, 920 acres would be burned and seeded to crested wheatgrass to improve antelope and deer habitat. Nesting cover for sage grouse could be reduced by this action. Nesting habitat for Swainson's and ferruginous hawks would not receive special protection, and vehicle access to this area could affect nesting success. Antelope kidding grounds are also within the nonsuitable acreage, and continued vehicle use could result in harassment of the animals during and after kidding.

Development of an open-pit mine would reduce wildlife habitat directly on 160 acres. Operation of the mine would have an ongoing impact to antelope which migrate through the area, and to sage grouse, Swainson's and ferruginous hawks which nest and feed in this portion of the study area.

Conclusion: Wildlife habitat and populations would be maintained on 42,280 acres designated wilderness. Deer and antelope forage would be improved on 920 acres in the nonsuitable portion, while reducing sage grouse habitat on the same acreage. Habitat for antelope and for Swainson's and ferruginous hawks would also be impacted.

Impacts on Livestock Grazing

In the portion recommended suitable, livestock grazing would continue at current levels. The proposed pipeline in the Long Draw vicinity and two reservoirs would not be constructed due to impacts on wilderness values. The opportunity to redistribute livestock would be foregone. Burn-and-seed treatments totaling 1,665 acres would be foregone, resulting in the loss of opportunity to increase livestock forage by 440 AUMs. Vehicle access for management of livestock would be restricted on 19 miles of ways, resulting in minor inconveniences to livestock operators. The use of heavy equipment on 2.5 miles of way for the maintenance of one waterhole once every 5 to 10 years would be allowed.

In the nonsuitable portion, livestock use would remain at current levels. Two reservoirs would be constructed to improve livestock distribution. Vehicle access would continue on 6 miles of ways and on 3 miles of new road.

Conclusion: Current livestock useage would not be significantly impacted, but the opportunity to redistribute cattle in the two allotments would be foregone. The opportunity to increase livestock forage availability by 440 AUMs would be foregone. Vehicle use would be eliminated on 19 miles of ways, resulting in a minor inconvenience to livestock operators.

Impacts on Recreation Use

The quality of primitive recreation and the high natural and scenic qualities would be enhanced and maintained in the portion recommended suitable. Vehicle use on 19 miles of ways would be eliminated, enhancing primitive recreation opportunities on approximately 520 acres. A decline of approximately 5 visitor days per year in vehicle-oriented recreation use would be balanced by an increase of approximately 5 visitor days per year in primitive recreation use.

This alternative would allow continued vehicle access to the 27,360 acres of the nonsuitable portion of the WSA, including 6 miles of ways. Vehicle-oriented recreation in this area is expected to remain at 200 visitor days per year or to increase slightly. Reservoir construction affecting 20 acres and burn-and-seed projects for wildlife affecting 920 acres would impact the natural and scenic qualities enjoyed by sightseers and visitors involved in nature study. Visually, approximately 3,100 acres would be impacted by these projects. Primitive types of recreation would be expected to continue at present levels or to decrease slightly.

Conclusion: Overall recreation use is expected to remain at approximately 200 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 3,970 AUMs. Projected mineral development would amount to one metallic mine. Overall recreation use would remain at 200 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. There would be no change in local personal income, except for an unknown level of increase attributable to the projected mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $50,000 plus an unknown amount generated by projected mineral development.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 69,640 acres

Impacts on Wilderness Values

None of the Hawk Mountain WSA would be recommended for wilderness designation. Wilderness values over the entire 69,640 acres would be subject to such projected activities as continuing and increasing livestock use, construction of waterholes and pipelines, vegetative manipulation for livestock and wildlife, mineral development and off-road vehicle use.

Naturalness

Implementation of livestock and wildlife projects proposed for this WSA would measurably impact its naturalness. Burn-and-seed projects for livestock would affect 1,665 acres. Burn-and-seed projects for wildlife would affect 920 acres. Four reservoirs would alter a total of 40 acres and visually affect another 80; construction of 9 miles of pipeline would alter 22 acres. Total direct disturbance of 2,645 acres would result from all proposed livestock and wildlife projects. The visual impact of these projects is estimated to be approximately 2,900 acres. The shifting of livestock from heavily grazed areas would impact its naturalness, presently characterized by a diversity of natural vegetative communities attributed to the lack of livestock grazing. A short term visual impact associated with the burn-and-seed would also indirectly affect 4,000 acres.

Naturalness would also be altered by an open pit gold mine on 160 acres, and 6 miles of minerals exploration roads on 6 acres. These developments would visually affect about 2,000 acres. Vehicle traffic on 25 miles of ways (visually affecting 770 acres) and by off-road vehicle travel would continue present impacts to naturalness and create new tracks.

Solitude

Opportunities for solitude would be reduced under this alternative due to the increase in mining, vehicle access, and livestock management activities. Increased and unrestricted vehicle access for recreational purposes would continue to impair such opportunities, especially in the open central portion of the WSA.

Primitive and Unconfined Recreation

Increased vehicle access and surface disturbance necessary to construct and maintain the four proposed reservoirs and to operate an open-pit mine would reduce opportunities for primitive and unconfined recreation within the WSA, particularly during hunting seasons. The impact of existing ways would be maintained, thereby continuing their impact on the primitive natural setting.

Special Features

The high quality of the Hawk Mountain WSA's native bunchgrass communities would be measurably and permanently reduced by a no wilderness action. Vegetative manipulation of 2,585 acres, construction of four reservoirs and 9 miles of pipeline, and an increase in licensed livestock use of up to 440 AUMs would reduce diversity of the natural vegetation and would introduce an exotic species on 2,725 acres. The construction of a pipeline in the vicinity of the Long Draw RNA and the accompanying shift of livestock into the area would devalue the area's usefulness for scientific and educational purposes.

The development of an open-pit mine would eliminate vegetation on 160 acres, and an additional 6 acres would be impacted by road construction and use. Habitat for sage grouse, antelope, and two candidate raptor species for threatened and endangered status would be reduced or impacted by mineral development.

Forage for antelope and deer would be improved on 1,665 acres. Habitat for other wildlife species, particularly sage grouse, would be reduced on those acres. Antelope kidding grounds and nesting habitat for Swainson's hawk would be vulnerable to disturbance by vehicles.

The fragile soils of the eastern portion of the WSA would be subject to damage by an increase in numbers of cattle and by possible off-road vehicle use.

Cultural resources would be subject to further disturbance by continued vehicle access into the WSA.

Conclusion: In the absence of wilderness designation, projected activities would both directly and indirectly impair wilderness values over 4,900 acres, with an additional 4,000 acres over the short term and further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire 69,640 acres would be open to mineral entry.

Energy Development

The entire WSA would be open to the development of energy resources, although no exploration other than casual is expected.

Conclusion: There would be no impact to energy development.

Mineral Development

The entire WSA would be open to mineral entry. Exploration for gold is expected. Positive indications for the existence of ore would lead to test drilling and the development of one open-pit mine directly affecting 160 acres and accompanied by the construction of 6 miles of road. Under the partial alternative it would be located in the nonsuitable portion; under this alternative it could be anywhere within the 69,640 acres.

Conclusion: One open-pit mine would be developed on 160 acres.

Impacts on Soils

Erodible volcanic soils in the eastern portion of the WSA would be disturbed by pipeline construction on 22 acres and by the presence of an increased number of livestock in the area. Reservoir construction, mining, and road construction would also locally impact soils on approximately 206 acres, with additional soil compaction peripheral to these water catchments resulting from concentrations of cattle.

Conclusion: A no wilderness action would disturb fragile soils on 22 acres in the east of the WSA and 206 acres elsewhere.

Impacts on Vegetation

The shifting of additional livestock into the WSA portion of the Pueblo-Lone Mountain grazing allotment by the construction of watering facilities would impact native bunchgrass and winterfat communities in the suitable area. This would particularly affect the Indian ricegrass/Thurber's needlegrass community within and surrounding the RNA as these species are especially palatable to livestock and are among the first plants to be grazed.

Native vegetation would be replaced on 2,585 acres slated for burning and seeding with crested wheatgrass. Construction of four reservoirs and 9 miles of pipeline would alter vegetation on 62 acres due to trampling and grazing by an increased number of livestock. Shifting in livestock in the eastern portion of the WSA would impact native plant communities in excellent condition by grazing and trampling. Continued or heavy use could lead to earlier seral stages or establishment of invader species such as cheatgrass and Russian thistle.

Conclusion: Vegetative manipulation on 2,585 acres would change vegetative composition from native to introduced species. Construction of four reservoirs and 9 miles of pipeline would alter 62 acres by increasing the livestock grazing in the vicinity of the water sources.

Impacts on Wildlife

Antelope populations and habitat would continue to be disturbed by occasional vehicle use on the existing 25 miles of ways. This seasonal vehicle disturbance would mainly affect antelope on portions of the low sage flats. Mineral development would reduce wildlife habitat by 160 acres. Ongoing mining activities would impact antelope migration and nesting of candidate threatened and endangered species (sage grouse, Swainson's and Ferruginous hawks).

Forage for antelope and deer would be improved on 920 acres directly, and 1,665 indirectly, by implementation of burn-and-seed projects. Habitat for sage grouse and other species could be reduced by such vegetative manipulation. The construction of reservoirs and pipelines would benefit wildlife by making more water available in the area.

The additional grazing allocation of 440 AUMs would leave sufficient forage to maintain existing populations of wildlife. However, increased livestock use would locally impact sage grouse habitat by removing residual ground cover in heavy utilization areas, reducing nesting and escape cover.

Conclusion: Habitat for deer and antelope would be improved on 2,585 acres. Sage grouse habitat would be reduced on 2,585 acres. Nesting habitat for Swainson's and ferruginous hawks would be subject to disturbance by vehicles and by mineral development.

Impacts on Livestock Grazing

An increase of 440 AUMs available for livestock would be realized by the implementation of burn-and-seed projects totaling 1,665 acres. The construction of four reservoirs would redistribute livestock within the Beatys Butte allotment.

The construction of 9 miles of pipeline along the eastern edge of the study area at Long Draw would allow for redistribution of livestock within the Pueblo-Lone Mountain allotment. Vehicle use for livestock management and facility inspection/maintenance would continue on 25 miles of ways.

Conclusion: The grazing use level within the WSA would increase by 440 AUMs in the Beatys Butte allotment and livestock use would be redistributed in both allotments. Four reservoirs and 9 miles of pipeline would be constructed. Vehicle use on 25 miles of ways for livestock management activities would not be restricted.

Impacts on Recreation Use

The entire 69,640 acres, including 25 miles of ways, would remain open to vehicle access. Hunting is the primary recreation activity associated with the use of the ways, and this activity is expected to remain stable as hunter numbers are controlled by a tag system implemented by ODFW.

Opportunities for primitive types of recreation would be reduced by the expansion of grazing operations, by mineral development and by a probable increase in off-road vehicle activity. A slight decrease in primitive recreation use is expected under this alternative.

Conclusion: Overall recreation use is expected to remain at about 200 visitor days per year or to decrease slightly.

Impacts on Local Personal Income

Livestock grazing would increase by 440 AUMs and the development of one metallic mine is projected. Overall recreation use would remain at approximately 200 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $5,280, plus an unknown level of increase attributable to the projected mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by at least $5,000.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (All Wilderness), mineral exploration, an increase in livestock forage, and redistribution of cattle within two grazing allotments would be foregone. There would be a slight inconvenience to livestock operators as a result of the closure of 25 miles of ways. Elimination of vehicle access for recreation would reduce opportunities for those who prefer this type of recreation.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, most existing short-term uses would continue, with some added, minor inconvenience to livestock operators resulting from the exclusion of vehicles for day-to-day inspection activities. Vehicle-oriented recreation would be replaced by primitive recreation. The long-term productivity of wilderness values would be preserved.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Managibility of the Area as Wilderness

The area recommended suitable in the all wilderness alternative would be manageable as wilderness. Mineral development on 1,280 acres of split-estate land could cause manageability problems under the all wilderness alternative if surface-disturbing exploration occurs or an open-pit gold mine is developed.

Rationale for the Selection of the Proposed Action

The all wilderness alternative is the Proposed Action because the benefits of preserving the many wilderness values in the area would exceed the benefits of the livestock and wildlife projects, and the mining, projected in the WSA. One of the most notable features in the WSA is the quality and diversity of native vegetative communities unmatched elsewhere in eastern Oregon. Designation would preserve the natural plant communities from alteration. The area also offers outstanding opportunities for solitude and primitive recreation, which could be jeopardized by the use of 25 miles of ways by vehicles, by greater levels of off-road vehicle use, by mining, and by livestock management activities.

The area also has valuable wildlife habitat, especially for migratory antelope herds, sage grouse and raptors. The wilderness values are directly related to the absence of development for intensive use.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to the Hawk Mountain WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning the BLM's wilderness recommendations or rationale were considered in developing the proposed action in the Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: The analysis of proposed pipeline on ungrazed native grasses was inadequate. **Response:** The pipeline proposed for Long Draw would adversely affect native grasses, as stated in the Impacts on Vegetation section of the No Wilderness/No Action alternative. Cattle would graze heavily on the most palatable species, of which Indian ricegrass, a primary component of the Long Draw plant community, is one.

Comment: Alternatives combining this WSA with the Rincon WSA and/or the Sage Hen Hills WSA should be considered. **Response:** These alternatives are not considered because of the importance of keeping the roads open for livestock management activities and for public access.

Comment: Kit fox and cougar range are not mentioned. **Response:** Historically, kit fox inhabited the area, but none have been sighted there for a number of years. Cougar do frequent the WSA. This information has been identified in the Affected Environment section, under Wildlife.

Comment: Antelope winter range is not mentioned. **Response:** Up to 1,000 pronghorn antelope may congregate within the WSA boundaries during the winter. This information is identified in the Affected Environment Section, under Wildlife.

Comment: Cultural values are not mentioned. **Response:** Significant cultural resources including a large lithic manufacture site have been located in the WSA. This information is now identified in the Wilderness (Special Features) section of the Affected Environment.

Table 1. Summary of Proposed Management Under Each Alternative, Hawk Mountain WSA (OR-1-146A)

Proposed Management	All Wilderness	Partial	No Wilderness No Action
Acres Designated as Wilderness	69,640	42,280	0
Acres Closed to ORVs by Wilderness Designation	69,640	42,280	0
Miles of Ways Closed	25	19	0
Acres of Mineral Estate Acquired[1]	0	1,280	0
Acres Withdrawn for Mineral Location and Leasing by Wilderness Designation	68,360	41,000	0
Acres of Projected Mineral Development	0	160	160
Miles of Road Constructed	0	3	6
Vegetative Manipulation for Wildlife: Brush Control with Seeding (acres)	0	920	0[2]
Structural Livestock Projects Developed:			
Reservoirs (number)	0	2	4
Pipelines (miles)	0	0	9
Vegetative Manipulation for Livestock: Brush Control with Seeding (acres)	0	0	1,665

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[1] Upon acquisition of mineral estate these lands would be withdrawn from mineral location and leasing.

[2] The 920 acres of burn-and-seed (crested wheatgrass) for wildlife under the Partial alternative are included in the 1,665-acre burn-and-seed project, which is primarily for livestock purposes under the No Wilderness/No Action alternative.

Table 2. Summary of Environmental Consequences of Alternatives, Hawk Mountain WSA (OR-1-146A)

Resource or Activity	All Wilderness (Proposed Action)	Partial	No Wilderness/No Action
Wilderness Values	Wilderness designation of 69,640 acres would protect and enhance existing wilderness values.	Wilderness designation would protect and enhance wilderness values on 42,280 acres. Acquisition of mineral estate would further preserve these values. Projected actions in the nonsuitable portion would impair wilderness values on 1,103 acres.	Projected management actions would impair wilderness values on 4,900 acres over the long term, and on 4,000 additional acres over the short term.
Energy and Mineral Development	Development precluded on 68,360 acres. One open-pit mine foregone.	Development precluded on 41,000 acres plus an additional 1,280 acres if mineral estate is acquired. No impact to mineral development in the nonsuitable portion. One open-pit mine would be developed.	No impact. One open-pit mine realized.
Soils	Fragile soils protected.	Fragile soils in the eastern portion protected. 183 acres disturbed in nonsuitable portion by projected actions.	Fragile soils disturbed on 22 acres. 206 acres disturbed in other portions of the WSA.
Vegetation	Existing vegetation preserved throughout. 25 miles of ways would revegetate.	Vegetation preserved in suitable area. 19 miles of ways would revegetate. In the nonsuitable portion, projected actions would adversely affect 1,143 acres.	Vegetation composition changed on 2,585 acres. An additional 62 acres affected by construction of watering facilities and increased grazing.
Wildlife	Wildlife habitat and populations preserved. Projects on 1,665 acres would be precluded which might result in a continued loss of some animals in stress years.	Wildlife habitat and populations preserved on 42,280 acres. Habitat improved on 920 acres in nonsuitable portion. Mineral development and vehicle use could impact antelope and raptor habitat.	Proposed wildlife projects allowed on 1,665 acres to improve forage for wildlife, but possible sage grouse population losses. Possible impacts to raptor nesting habitat due to vehicle use and mineral development.
Livestock Grazing	Opportunity to increase livestock forage by 440 AUMs foregone. Minor inconvenience to livestock operators from vehicle restrictions on 25 miles of ways.	Opportunity to increase livestock forage by 440 AUMs foregone. Two reservoirs constructed in the nonsuitable portion. Minor inconvenience to livestock operators due to restrictions on 19 miles of ways.	Grazing use level increased by 440 AUMs. Livestock redistribution realized. Four reservoirs and 9 miles of pipeline constructed. No restrictions on vehicle use.
Recreation Use	Use expected to increase by 20 visitor days per year. Change from motorized use to primitive use.	Use levels not expected to change.	Use levels not expected to change.
Local Personal Income	Annual local personal income would increase to approximately $50,300.	Annual local personal income would increase over the current $50,040 by an unknown amount attributable to projected mineral development.	Annual local personal income would increase by approximately $5,000, plus an unknown amount attributable to projected mineral development.

Table 3. Classification of Energy and Mineral Potential, Hawk Mountian WSA (OR-1-146A)

Commodity	Area	Level of Potential	Level of Certainty
Metals (gold, silver, mercury, copper)	See Map 4	M	B
	See Map 4	M	A
Geothermal	See Map 4	M	B
	Rest of WSA	L	B
Uranium/Thorium	Entire WSA	O	A
Coal	Entire WSA	L	C
Oil/Gas	Entire WSA	L	B
Limestone	Entire WSA	O	A
Bentonite	See Map 4	M	B
	Rest of WSA	L	A
Zeolites	See Map 4	L	B
	Rest of WSA	O	A
Diatomite	See Map 4	M	B
	Rest of WSA	O	B

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

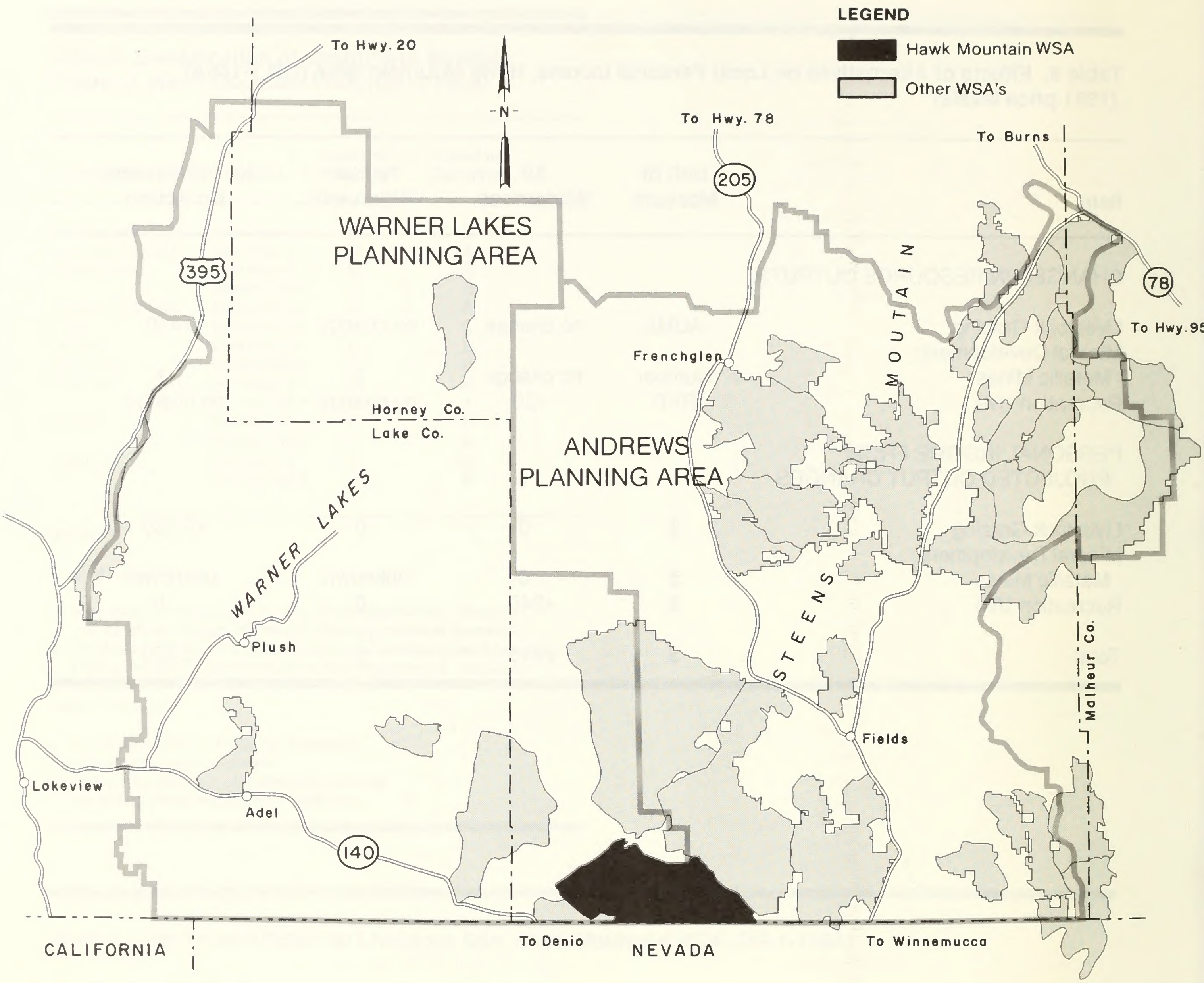
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

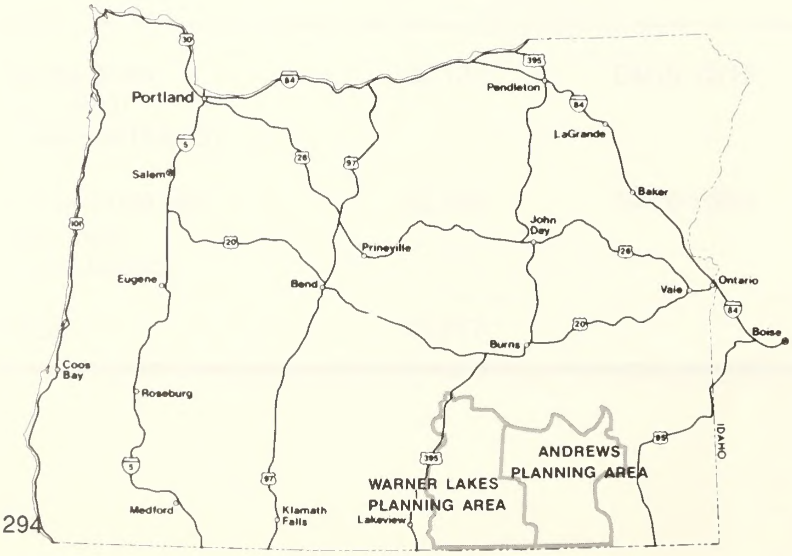
Table 4. Existing and Potential Livestock Use, Hawk Mountain WSA (OR-1-146A)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Beatys Butte (No. 0600) (Lakeview District)	26,121	04/15-12/15	9	3,850
Pueblo-Lone Mtn. (No. 6020) (Burns District)	22,896	04/16-10/31	8	144
Totals	49,017			3,994

Table 5. Effects of Alternatives on Local Personal Income, Hawk Mountain WSA (OR 1-146A) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	no change	no change	+440
Mineral Development:				
Metallic Mines	Number	no change	1	1
Recreation Use	RVD	+20	no change	no change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	0	0	+5,280
Mineral Development:				
Metallic Mines	$	0	unknown	unknown
Recreation Use	$	+240	0	0
Total	$	+240	0	+5,280





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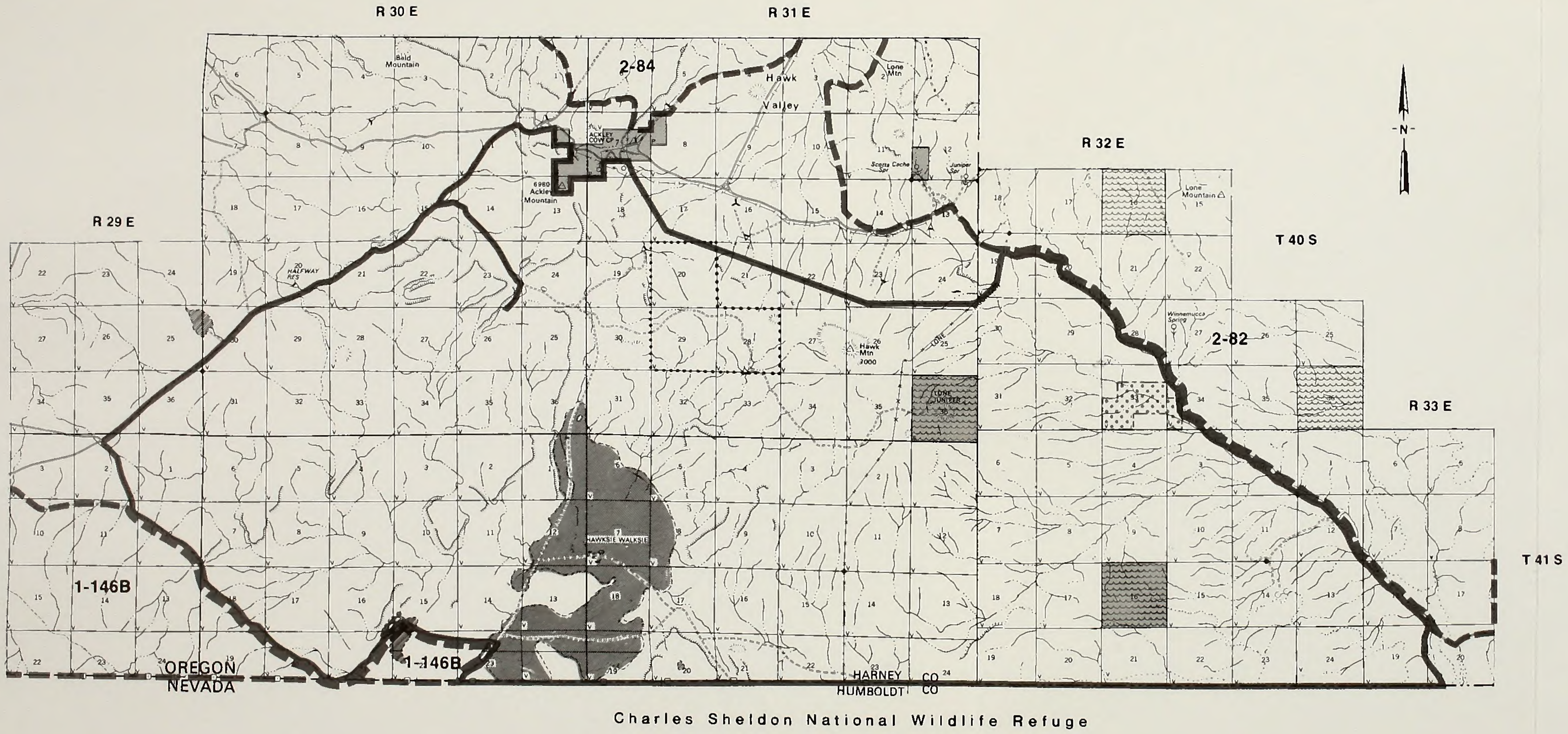
Hawk Mountain WSA
OR-1-146A

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▨ BLM Land Studied Under Section 202 of FLPMA (Other BLM Land in WSA Studied Under Section 603 of FLPMA)

━ Wilderness Study Area Boundary

━ ━ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

■ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

⁘ Long Draw Research Natural Area

⬚ **Proposed Research Natural Area**

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OR-1-146A

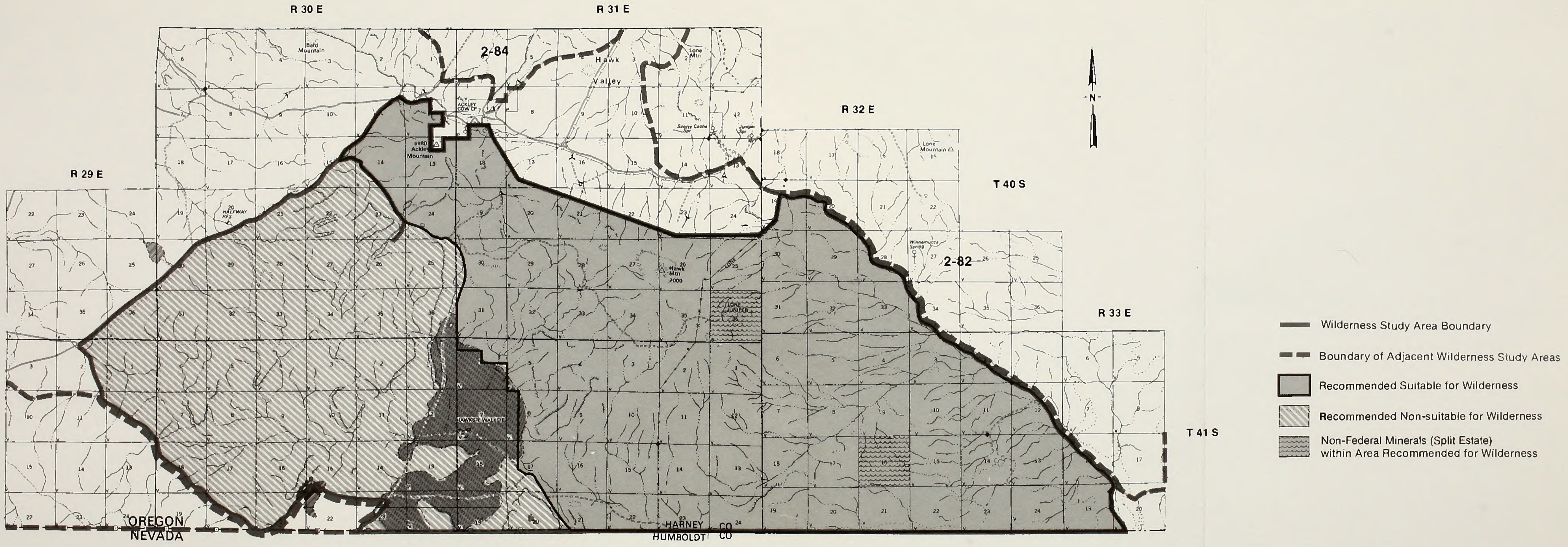
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2

LOCATION MAP

MAP 1



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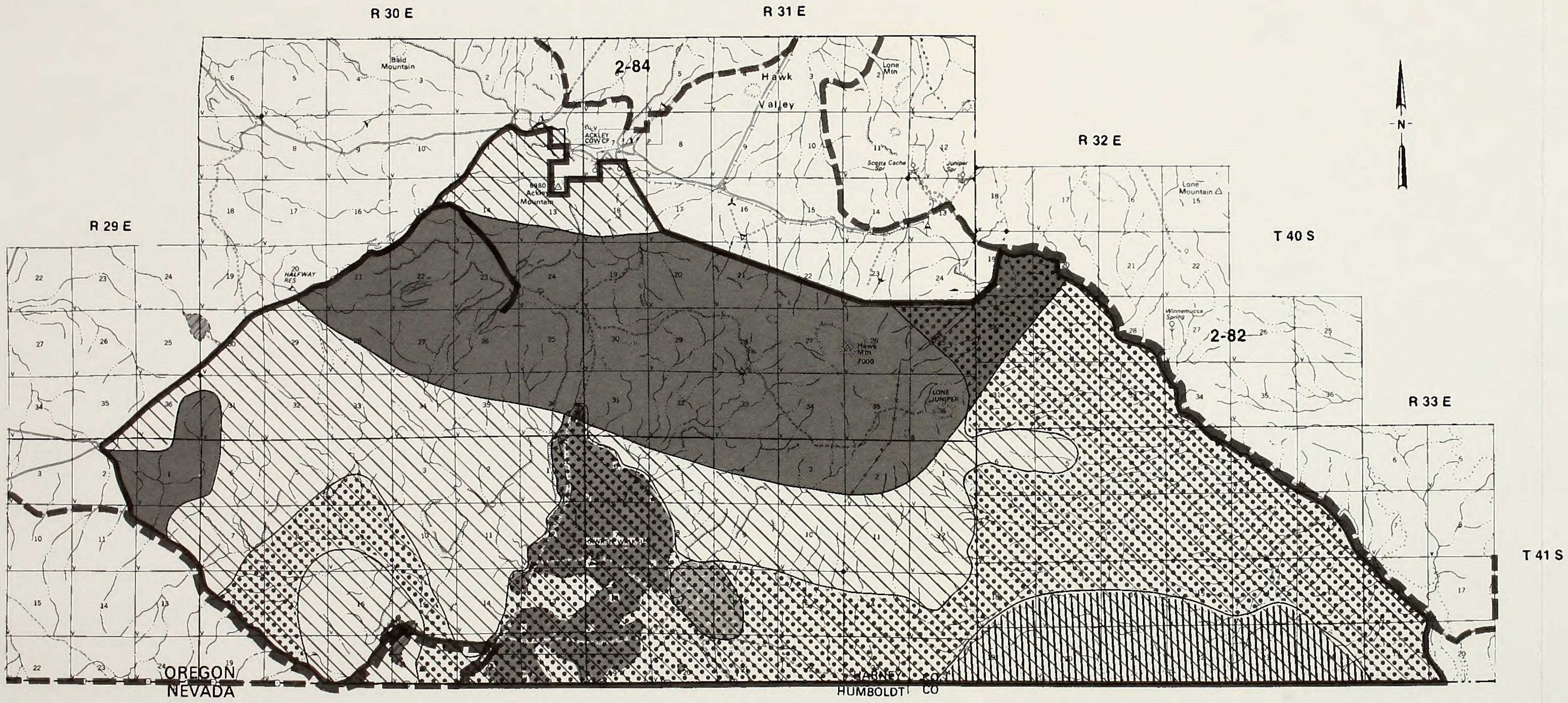
PARTIAL ALTERNATIVE

MAP 3



⸬ **Moderate Potential (MB) for Diatomite**

▥ **Moderate Potential (MB) for Geothermal Resources**

▒ **Moderate Potential (MB) for Bentonite**

MA ▧ **Moderate Potential for**
MB ■ **Copper, Mercury, Gold and Silver**

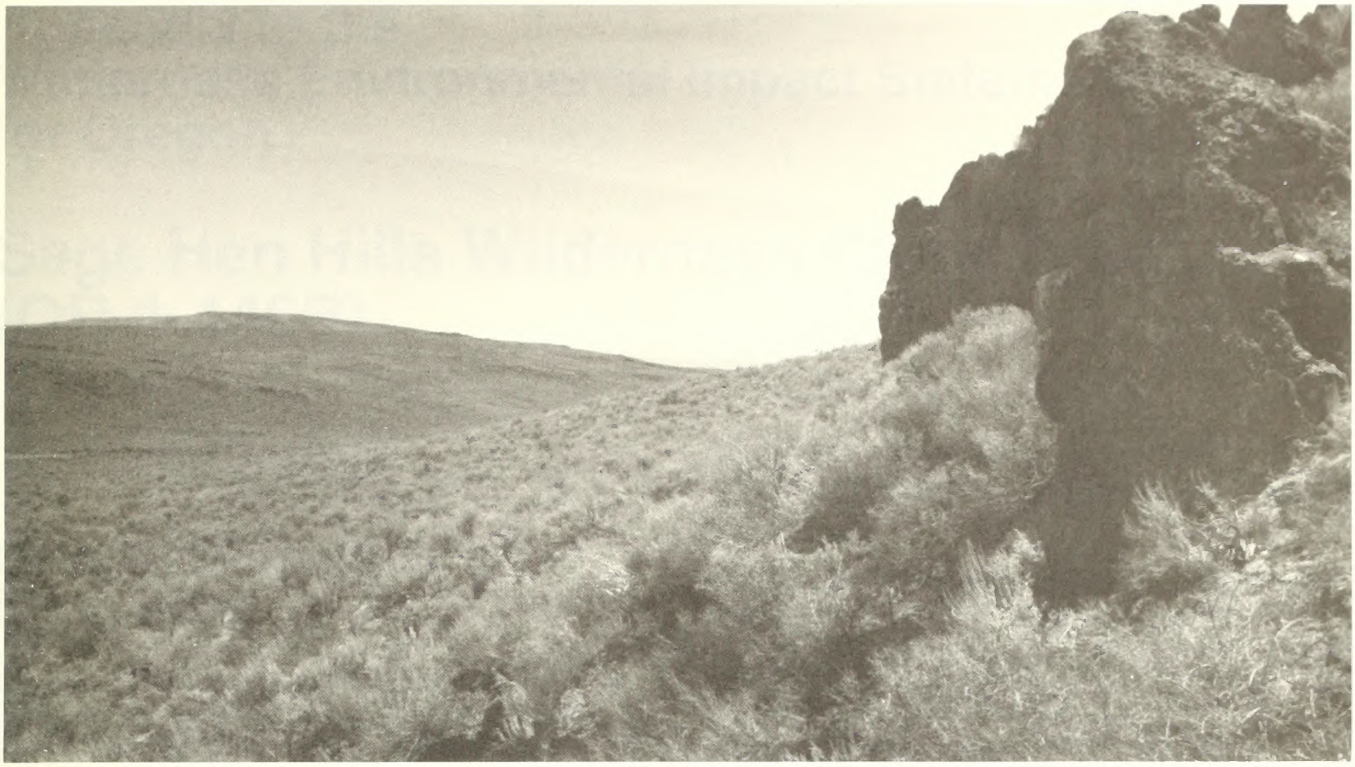
U. S. Department of the Interior
Bureau of Land Management
Lakeview/Burns Districts

Hawk Mountain
OR-1-146A

MODERATE OR HIGH POTENTIAL
MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Hawk Mountain WSA, OR-1-146. Near Rastus Waterhole in the north end of the WSA in the vicinity of Hawk Mountain. Within the area recommended suitable under the proposed action (all wilderness) and partial alternative. This area contains some of the more complex grassland communities within the WSA. June 1984.

Hawk Mountain WSA. OR-1-146. Acty Mountain area. Within area recommended suitable under the partial alternative and proposed action (all wilderness). Shows terrain typical of this area and late snow on the north-facing slopes. June 1984.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Sage Hen Hills Wilderness Study Area (OR-1-146B)

1. Introduction

General Description of Study Area

The Sage Hen Hills Wilderness Study Area (WSA) is located in southwestern Harney County, Oregon, approximately 73 miles east of Lakeview, Oregon (see Map 1). The closest highway is State Highway 140, adjacent to the western boundary of the WSA.

The study area, located in the Lakeview District, contains 8,520 acres of public land (see Map 2). The adjacent lands to the north, east and west are public lands. A high standard gravel road defines the western boundary, and a low standard dirt road defines the northeastern boundary. A fence at the northern edge of the Charles Sheldon National Wildlife Refuge in Nevada forms the southern boundary of the WSA.

The study area is characterized by low, rolling sagebrush hills with moderate topographic relief. Elevation is approximately 6,000 feet. A small canyon cuts across the central portion of the WSA. Vegetation on the WSA is a mixture a big sagebrush/bunchgrass and low sagebrush/bunchgrass communities.

Interrelationships

To the northeast, the Sage Hen Hills WSA shares a common road boundary with the Hawk Mountain WSA (OR-1-146A). To the south, at the Oregon-Nevada State line, the Sage Hen Hills WSA adjoins the Sage Hen Hills Unit (21,800 acres) of an administratively-endorsed wilderness proposal on the Charles Sheldon National Wildlife Refuge (Sheldon NWR), managed by the U.S. Fish and Wildlife Service (FWS). The Sheldon NWR is dedicated to the preservation of habitat for pronghorn antelope and other wildlife species of the sagebrush steppe. A fenceline marks the boundary between the refuge and the WSA.

The WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) 2,507-square-mile Beatys Butte Wildlife Unit. The WSA is on the travel corridor for pronghorn antelope between the Sheldon and the Hart Mountain Wildlife Refuges. The number of antelope in the study area can vary from a few individuals to 100 or more in a single group. Relatively small numbers of mule deer use the WSA year-round. ODFW goals for mule deer in the Beatys Butte unit are to maintain an adult population of 1,800 animals. No goals have been set for antelope or sage grouse. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

Harney County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources selected as issues specifically for the Sage Hen Hills WSA include:

- impact on wilderness values,
- impact on livestock grazing use levels and management,
- impact on sage grouse and antelope habitat, and
- impact on mineral development.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgement regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected, and do not definitively forecast the outcome of site specific analysis required prior to implementation of any project in a wilderness area.

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (proposed action)

An enhanced wilderness alternative is not analyzed because there is no opportunity to enhance wilderness values by acquiring private inholdings, closing interior roads or acquiring adjacent private land. An alternative which would combine Sage Hen Hills WSA with the adjacent Hawk Mountain WSA (OR-1-146A) is not analyzed because the road between the two is important access for livestock operators and the public.

All Wilderness

The all wilderness alternative would recommend all 8,520 acres of public land in the WSA suitable as wilderness in combination with adjoining Sheldon NWR wilderness proposal (see Map 2). This alternative assumes that the adjoining Sheldon NWR Sage Hen Hills Unit (21,800 acres) will be designated as wilderness, since the BLM portion does not have wilderness characteristics on its own.

Energy and Mineral Developments Actions

Under this alternative, the entire 8,520 acres of the Sage Hen Hills WSA would be withdrawn from all appropriations under mining and mineral leasing laws.

Wildlife Habitat Management Actions

Wildlife habitat for all species on the entire 8,520 acres would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM wilderness management policy. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the current use level of 485 AUMs. The Sage Hen Hills WSA is entirely within the Beatys Butte allotment (600); the season of use would remain as identified in Table 4. Livestock management is accomplished on horseback. Maintenance of the existing reservoir would require the use of mechanized heavy equipment once every 10 years.

Recreation Management Actions

The entire 8,520 acres would be closed to motorized vehicle use. Current recreational use is estimated to be less than 100 visitor days per year; vehicle-oriented recreation is minimal due to the absence of roads and ways in the WSA. There are no recreation projects proposed.

No Wilderness/No Action (Proposed Action)

The no wilderness/no action alternative would recommend the entire WSA as nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire 8,520-acre WSA would be open to energy and mineral exploration and development. Because of anomalous values obtained in a geochemical stream sediment survey, the position of the WSA along the Eugene-Denio Lineament, and the WSA's proximity to mineralized areas on the Sheldon NWR, the potential for gold, silver, mercury and copper is moderate. Therefore, geochemical and geophysical surveys, possible exploratory drilling and development of one 160-acre open-pit mine are anticipated. Potential for the occurrence of diatomite is moderate on 1,000 acres, although no exploration other than casual is expected due to the remoteness of the area and the ready availability of this commonly-occurring resource outside the WSA.

Wildlife Habitat Management Actions

Habitat would be managed to support existing populations of wildlife in accordance with ODFW's management goals and consistent with BLM management goals. The primary manner is which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. No wildlife projects are proposed for the WSA.

Livestock Management Actions

A burn-and-seed treatment affecting approximately 900 acres on the west side of the WSA is proposed to increase forage availability for livestock by as much as 249 AUMs. Maintenance of the existing reservoir would be accomplished by heavy equipment once every 10 years.

Recreation Management Actions

All 8,520 acres would remain open to vehicle-oriented recreation. Current recreation use is estimated to be less than 100 visitor days per year.

Summary

Table 1 summarizes the projected management actions of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, of that may be affected by the alternatives.

Wilderness Values

Naturalness

Sage Hen Hills WSA and adjoining Sheldon NWR lands are in a substantially natural condition with a minimum of unnatural features. The Sage Hen Hills WSA contains one small reservoir adjacent to the north boundary road just inside the WSA. It is noticeable only in its immediate vicinity. A barbed wire fence defines the boundary between the Sheldon NWR and BLM lands. While vehicle tracks have been observed, there are no clearly-defined roads or ways on the interior of the WSA.

The area affected by unnatural features within the WSA is about 20 acres.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude within the study area are somewhat limited due to the relatively small size, moderate topographic relief, and low vegetative cover of most of the area. The remoteness of the WSA and the adjacent wild lands do contribute to the feeling of solitude. There is one small canyon and several shallow draws offering visual screening from other visitors. Opportunities for solitude are outstanding when considered in conjunction with the Sage Hen Hills portion of the Sheldon NWR to the south. The combined BLM (8,520 acres) and Sheldon NWR (21,800 acres) area would offer considerably improved opportunity for solitude over the BLM portion alone.

Outstanding opportunities for backpacking, day hiking, horseback riding, camping and wildlife observation exist when the Sage Hen Hills WSA is considered in conjunction with the adjacent refuge lands, but such opportunities are not outstanding within the 8,520-acre WSA itself.

Special Features

Sage grouse, a Federal candidate species for listing as threatened or endangered, also inhabits the area, and one strutting ground has been identified within the WSA. Kit fox historically inhabited the WSA, but no sightings of this species have been reported for a number of years.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province, with potential natural vegetation of sagebrush steppe.

The vegetative community listed in the Basin and Range section of the Oregon Natural Heritage Plan and occurring in the WSA is low sagebrush/Sandberg's bluegrass.

Sage Hen Hills WSA is located within 5 hours' driving time of three standard metropolitan statistical areas with populations over 100,000: Medford, Oregon; Boise, Idaho; and Reno, Nevada.

Energy and Mineral Development

Energy and mineral resources were evaluated by the BLM using available geologic data and data provided in the TERRADATA report titled "Assessment of Geology, Energy, and Minerals Resources of the Lone Mountain Geologic Resource Area." Lands have been classified according to a subjective rating system which divides areas by geologic favorability, and also identifies the amount/quality of data on which the rating was done. A description of the rating system is provided in the Statewide EIS volume.

Details of the mineral and energy potential ratings are shown in Table 3 and Map 3.

The surface rocks of the WSA consist of Tertiary-age volcanic flows and welded tuffs of rhyodactic composition, and Tertiary-age semiconsolidated alluvium. The subsurface geology is largely unknown, but pre-Tertiary marine sedimentary rocks may occur at depth.

Energy Resources

Oil and gas and geothermal resources are not postulated to exist in economic quantities within the WSA. As of October 16, 1987, there were no oil and gas or geothermal leases in the study area.

Mineral Resources

The entire WSA is considered to have a moderate potential for the occurrence of copper, mercury, silver and gold based on indirect evidence. There is also considered to be a moderate potential for the occurrence of diatomite on 1,000 acres, also based on indirect evidence. As of October 16, 1987, there were no mining claims in the WSA.

Vegetation

Vegetation in the Sage Hen Hills WSA is composed mainly of sagebrush/bunchgrass communities in mid- to late seral stage. Potential natural community is sagebrush/bunchgrass. Two other native communities which are found in the WSA are big sagebrush/creeping wildrye grass and big sagebrush/Thurber's needlegrass. Abundant forbs provide colorful wildflower displays in late spring and early summer. No threatened or endangered plant species are known to exist in this WSA.

Wildlife

Within the study area are mule deer, pronghorn antelope, coyote, bobcat, badger, weasels, marmot, black-tailed jackrabbit, cottontail rabbit, ground squirrel, bats and possibly cougar. Historically, the range of the kit fox extended into the Sage Hen Hills WSA, but none of this species has been sighted in the area for a number of years. Western rattlesnake, fence lizard and other reptiles can also be found here.

Sage Hen Hills WSA is located on the travel route of antelope between Hart Mountain and the Sheldon refuge. As a consequence, different herds of antelope use the study area at different times of the year. The number of animals can vary from a few individuals to 100 or more in a single group. Herd condition is good throughout the refuge and BLM lands used by the animals. Relatively small numbers of mule deer use the area year-round. Observed condition of the deer is also good.

Sage grouse, a Federal candidate species for listing as threatened or endangered, inhabit the area and have established at least one strutting ground in the low sage community in the northern portion of the WSA. Other birds include red-tailed and rough-legged hawks, prairie falcon, American kestrel, turkey vultures, burrowing owl, raven, loggerhead shrike, mourning doves, sage sparrow and rock wren.

Watershed

There are no perennial streams or springs in the WSA.

Livestock Grazing

The study area is entirely within the Beatys Butte grazing allotment. Existing livestock developments (among the features listed in the Naturalness section) are limited to one small reservoir in the northern portion and the boundary fence on the south.

Current livestock use in the WSA is 485 AUMs, which represents 2 percent of the livestock use in the allotment.

Livestock operators regularly use the boundary road between the Sage Hen Hills and the Hawk Mountain WSAs for vehicle access to check and salt livestock and to maintain the existing reservoir (once every 10 years). Livestock management activities within the study area are accomplished on horseback.

Recreation Use

Vehicle-oriented recreation is mainly related to antelope hunting and is limited almost entirely to the boundary roads. Primitive types of recreation in the WSA include horseback riding, hunting, hiking and nature study. Total use-levels on the BLM WSA are estimated to be less than 100 visitor days per year. The Sheldon NWR receives considerably more recreation use.

Local Personal Income

The current livestock use level of 485 AUMs generates approximately $5,820 of local personal income annually, while approximately $1,000 of local personal income is generated annually from the fewer than 100 visitor days of recreation activity. The overall total from these activities is approximately $6,820. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives in this WSA. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 8,520 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

Wilderness designation for this WSA is dependent upon the designation of the adjacent Sage Hen Hills Unit administered by the FWS. The all wilderness alternative would add a total of 30,320 acres to the NWPS (8,520 acres BLM and 21,800 acres FWS). Wilderness values of naturalness, solitude, primitive and unconfined recreation and special features, including sage grouse and potential kit fox habitat, would be retained.

Naturalness

The area's naturalness, characterized by the low sagebrush/bunchgrass community, the absence of internal ways, and only one unnatural feature (a small reservoir), would be preserved under this alternative.

Solitude

The combined BLM and FWS lands would offer outstanding opportunities for solitude based on the large size and remoteness of the wilderness areas. Opportunities for solitude would improve slightly with elimination of the rare and occasional ORV use which has occurred.

Primitive and Unconfined Recreation

Wilderness designation would maintain existing primitive and unconfined recreation opportunities and by preserving the present primitive setting.

Special Features

This alternative would preserve the sage grouse habitat and strutting ground from vegetative manipulation. It would also preserve potential kit fox habitat.

Conclusion: Wilderness designation of the this WSA and the adjacent FWS lands would protect wilderness values and provide excellent opportunities for solitude within the entire combined 30,320 acres.

Impacts on Energy and Mineral Development

The entire 8,520-acre WSA would be withdrawn from all appropriations under mining and mineral leasing laws.

Energy Development

Exploration and development of energy resources would be precluded in the WSA. Such activity is not expected due to low potential for the occurrence of oil and gas and geothermal reserves.

Conclusion: No impact to energy development is expected.

Mineral Development

The entire WSA would be closed to mineral entry. Developement of an open pit gold mine would be foregone. Casual exploration for diatomite is expected, but no development is anticipated due to the remoteness of the area and the ready availability of this commonly-occurring resource outside of the WSA.

Conclusion: Development of an open pit gold mine would be foregone.

Impacts on Vegetation

Natural vegetative communities within the study area as described in the vegetation section under Affected Environment would be preserved under this alternative.

Conclusion: Vegetation would be preserved.

Impacts on Wildlife

Wildlife habitat and forage for all species within the Sage Hen Hills WSA would be preserved and protected, and ODFW's goals for the management of game and nongame species would be met. Sage grouse habitat, in particular, would be preserved.

Conclusion: The all wilderness alternative would preserve existing wildlife habitat.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 485 AUMs. The proposed 900-acre burn-and-seed project would not be allowed and an opportunity to increase livestock forage by 249 AUMs would be foregone. Heavy equipment would be used for the maintenance of the existing reservoir adjacent to the boundary road once every 10 years.

Conclusion: A potential increase of 249 AUMs of forage would be foregone.

Impacts on Recreation Use

The 8,520-acre WSA would be closed to vehicle-oriented recreation. The impact would be minimal due to the lack of vehicle ways in the WSA. Recreation use would remain at less than 100 visitor days per year.

Conclusion: Recreation use would remain at less than 100 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would remain at 485 AUMs and overall recreation use would continue at the current level of fewer than 100 visitor days per year. There would be no net change in local personal income, as shown in Table 5.

Conclusion: Annual local personal income generated form resource outputs in the WSA would remain at approximately $6,800.

No Wilderness/No Action (Proposed Action)

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 8,520 acres

Impacts on Wilderness Values

The no wilderness/no action alternative would recommend the entire 8,520 acres in the WSA nonsuitable for wilderness. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and special features, including sage grouse and potential kit fox habitat, would not receive special legislative protection and would be subject to the effects of proposed vegetative manipulation, possible grazing increases and mineral development. The Sheldon NWR administratively-endorsed wilderness would not benefit from addition of 8,520 acres improving opportunities for solitude and special features associated with wildlife habitat.

Naturalness

Naturalness would be altered on approximately 900 acres by burning existing vegetation and seeding with crested wheatgrass. The visual impact would affect an additional 500 acres, for a total of about 1,400 acres. The development of one open pit mine would directly impact 160 acres and would indirectly influence an additional 400 acres. Access to the mine would remove vegetation from an additional 3 acres. Total acreage affected by projected actions is 1,063 directly and an additional 900 acres indirectly.

Solitude

Solitude would be impacted by the sights and sound of development of a 160-acre open pit mine and 3 miles of road. The total impact would affect 563 acres, including visual impact.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation would be reduced on 163 acres directly and an additional 400 acres indirectly by mineral development. The reduction in a natural setting due to the 900-acre burn-and-seed project would also reduce opportunities for primitive and unconfined recreation.

Special Features

Vegetative manipulation on approximately 900 acres and the accompanying 249-AUM increase in the number of cattle would impact sage grouse habitat in the western portion of the study area by eliminating sagebrush. There is at least one strutting ground within 2 miles of the proposed project. Mineral development would eliminate 163 acres of sage grouse habitat. Reduction of sage grouse habitat by 1,063 acres would result in a corresponding population decline.

Conclusion: In the absence of wilderness designation, projected activities would impair wilderness values over approximately 12 percent of the WSA directly and approximately 23 percent including indirect effects, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire WSA would be open to energy and mineral entry.

Energy Resources

Energy resources are not postulated to exist in the WSA in economic quantities. Only casual exploration is expected.

Conclusion: There would be no impact to energy development under this alternative.

Mineral Resources

Exploration for gold is expected, with test drilling and development of one 160-acre open pit mine projected. Casual exploration for diatomite is also anticipated, with no development projected.

Conclusion: One open pit gold mine would be developed.

Impacts on Vegetation

The proposed burn-and-seed project on 900 acres would alter vegetative diversity by eliminating shrubs and converting vegetation to crested wheatgrass. Increased livestock allocation of 249 AUMs would further impact vegetation by the trampling and grazing effects with the concentration of more livestock in the vicinity of the existing reservoir.

Development of an open pit mine would remove vegetation from 160 acres. An additional 3 acres of vegetation would be removed by the construction of an access road.

Conclusion: Vegetation would be altered on 900 acres and eliminated from an additional 163.

Impacts on Wildlife

The burn-and-seed project would provide additional forage for mule deer and antelope in spring and fall months. Herd numbers are not expected to increase from this project, but herd condition would improve slightly due to higher nutritional potential on lands seeded. This same project would also alter the existing vegetation to a less suitable habitat type for sage grouse and nongame wildlife species by eliminating sagebrush and other shrubs on 900 acres. This would result in a slight decline in population numbers.

Conclusion: The condition of antelope and deer herds would improve slightly. Habitat for sage grouse and nongame wildlife species would be reduced.

Impacts on Livestock Grazing

An additional 249 AUMs of forage in the Beatys Butte allotment could be realized within the WSA by the implementation of a 900-acre burn-and-seed project. All other livestock management actions would be unchanged, including reservoir maintenance.

Conclusion: There would be an increased forage livestock allocation of 249 AUMs.

Impacts on Recreation Use

The proposed burn-and-seed project (900 acres) and mineral development (163 acres) would alter the opportunities for nature study and sightseeing on 1,063 acres directly and alter the primitive setting on an additional 900 acres indirectly. Hunting opportunities could be reduced in the vicinity of the mining activity. There would be little or no change in overall recreation use. Rare and occasional ORV use may continue.

Conclusion: Opportunities for recreation would be reduced by activities on 1,963 acres. Overall recreation use is expected to remain at less than 100 visitor days per year.

Impacts on Local Personal Income

Livestock grazing would increase by 249 AUMs, increasing local personal income by approximately $2,988 annually. Projected development of one open-pit mine would also increase local personal income, but the exact annual figure cannot be predicted. Local personal income from recreation activity would remain at approximately $1,000 per year as no change in recreation activity is forseen.

Table 5 shows the effects on local personal income generated from these activities. The total effect would be a net increase of approximately $3,000 per year, plus an unknown level of increase attributable to mineral development.

Conclusion: An increase of approximately $3,000 in annual local personal income would be generated from resource outputs in the WSA.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (no wilderness/no action), the entire 8,520 acres of the Sage Hen Hills WSA would be subject to activities which would unavoidably impact its wilderness values. The burn-and-seed project for livestock would affect 1,400 acres, and mining activity would affect 563 acres. Projected activities would impair wilderness values over 23 percent of the study area.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, all short-term uses would continue and future development options, including projected mineral development and livestock projects, would remain open. Long-term productivity of wilderness values would be directly lost on 163 acres with surface disturbance from mining and on 900 acres from burning of native vegetation and seeding of an exotic species, with further declines from other uses over the long term.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, a 900-acre burn-and-seed project and a 160-acre open pit mine would result in an irretrievable commitment of the wilderness resource and irretrievably reduce existing wilderness values.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The WSA would be manageable as wilderness in association with the adjoining wilderness proposal for the Sheldon NWR. Boundaries of the BLM portion are easily identifiable.

The single existing livestock development within the WSA, a small reservoir, could easily be maintained by mechanized equipment driven in on the boundary road. The reservoir is only a few dozen feet from this road. The impact on wilderness values would be minimal.

Rationale for Selection of the Proposed Action

The BLM-administered portion of the roadless area contains opportunities for rangeland development that would benefit livestock and potential for mineral development. Although the WSA, in conjunction with adjacent lands on the Sheldon NWR, meets the qualifications for study, the wilderness values assessment of the WSA indicates that the area does not have many attributes, such as ecological diversity, varied recreation opportunities and scenic qualities. The benefits to be gained from development of rangeland and mineral resources outweigh the benefits of preserving the WSA's wilderness values.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to the Sage Hen Hills WSA concerning adequacy of the analysis in this appendix and responses to those comments. These comments were received both in writing and oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: An alternative merging this WSA with the Hawk Mountain WSA should be considered. **Response:** This alternative is not considered because of the importance of keeping the road open for livestock management activities and public access.

Comment: The impact on the burn-and-seed project on antelope kidding grounds was not addressed. **Response:** No known kidding grounds occur in the area of the proposed project.

Comment: Impacts of burn-and-seed on antelope migration route are not addressed. **Response:** Spring forage would be available for the antelope leaving winter range to the south. Actual movement would only be impeded during project implementation, estimated to be approximately 36 hours.

Comment: The good condition of the grassland is not brought out in the EIS. **Response:** The Vegetation section of Affected Environment includes the discussion of the ecological stage of the grassland. Where soils are adequate, good stands of bunchgrasses do occur in the WSA.

Table 1. Summary of Proposed Management Under Each Alternative, Sage Hen Hills WSA (OR-1-146B)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	8,520	0
Acres Closed to ORVs by Wilderness Designation	8,520	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	8,520	0
No. of Mines Developed	0	1
Miles of Road Constructed	0	3
Vegetative Manipulation for Livestock: Brush Control with Seeding (acres)	0	900
Increase in Livestock Forage Allocation	0	249

Table 2. Summary of Environmental Consequences of Alternatives, Sage Hen Hills WSA (OR-1-146B)

Resource or Activity	All Wilderness	No Wilderness/No Action (Proposed Action)
Wilderness Values	Wilderness designation of 8,520 acres would result in protection and enhancement of existing wilderness values. This proposal would be dependent on wilderness designation of the adjacent national wildlife refuge wilderness proposal.	Projected management actions would impair the area's naturalness, solitude, opportunities for primitive recreation and its sage grouse habitat on 1,063 acres.
Energy and Mineral Development	Development precluded on 8,520 acres of public land, which includes 8,520 acres with moderate potential for gold, silver, mercury and copper and 1,000 acres with moderate potential for diatomite.	One 160-acre open-pit mine would be developed.
Vegetation	Vegetation would be preserved in natural condition.	Vegetative diversity would be reduced on 900 acres by proposed vegetative manipulation and removed from 163 acres for mineral development. Utilization would increase with a corresponding decrease in ground cover.
Wildlife	Habitat and populations would be maintained throughout the area.	900-acres burn-and-seed for livestock and removal of 163 acres of vegetation for mineral development would reduce sage grouse and potential kit fox habitat. Nesting and escape cover would be reduced due to additional allocation of livestock.
Livestock Grazing	Burn-and-seed project would be precluded and opportunity to increase forage by 249 AUMs foregone.	Potential of increase of 249 AUMs for livestock would be realized.
Recreation Use	Recreation use level would be not be affected.	Development of an open-pit mine would reduce primitive recreation opportunities.
Local Personal Income	Annual local personal income would remain at approximately $6,800.	Annual local personal income would increase by approximately $3,000, plus an unknown increase due to mineral development.

Table 3. Classification of Energy and Mineral Potential, Sage Hen Hills WSA (OR-1-146B)

Commodity	Area	Level of Potential	Level of Certainty
Metals	See Map 3	M	B
	Rest of WSA	M	A
Geothermal	Entire WSA	L	B
Uranium/Thorium	Entire WSA	0	A
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	L	B
Limestone	Entire WSA	0	A
Bentonite	See Map 3	L	B
	Rest of WSA	0	A
Zeolites	See Map 3	L	B
	Rest of WSA	0	A
Diatomite	See Map 3	M	B
	Rest of WSA	0	B

Legend:

Level of Potential

0 - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulation of energy/mineral resource
H - High potential for accumulation of energy/mineral resource

Level of Certainty

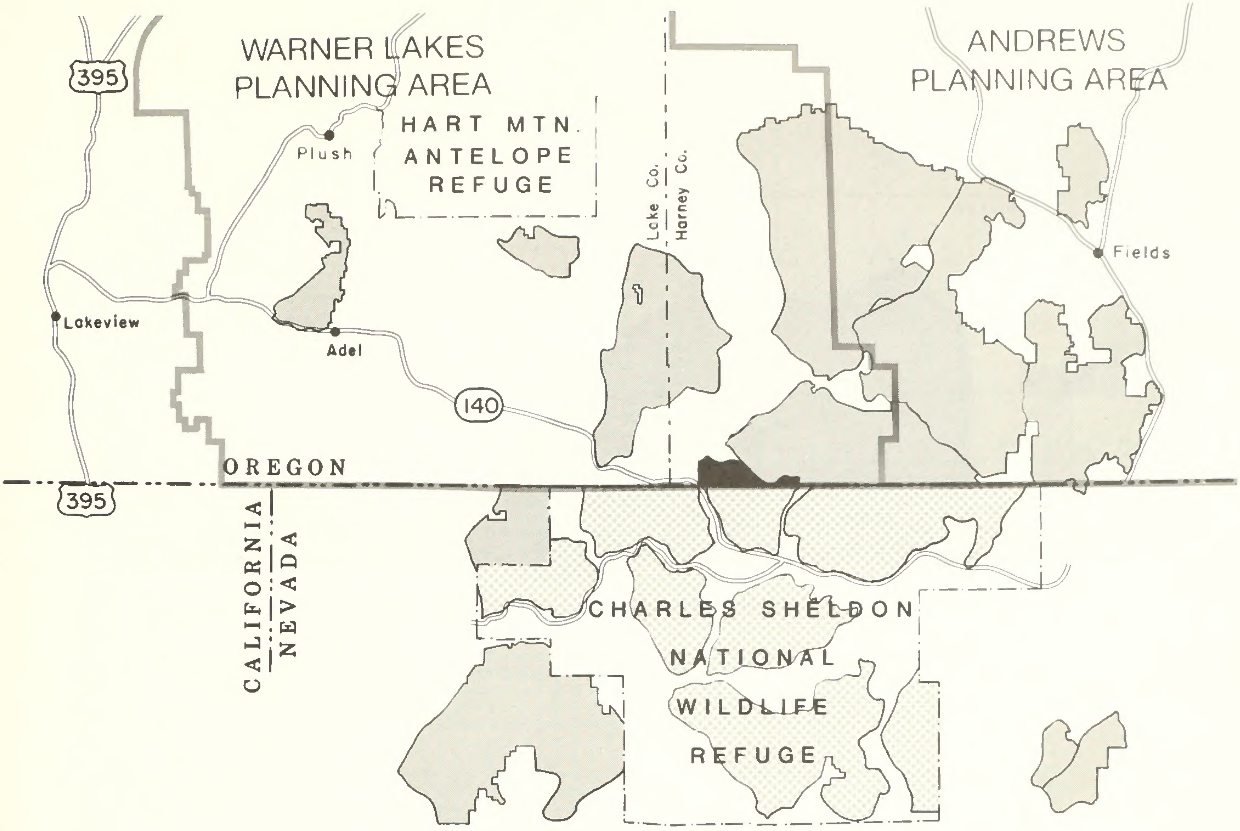
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

Table 4. Existing Livestock Use, Sage Hen Hills WSA (OR-1-146B)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Beatys Butte	26,121	04/15-12/15	2	485

Table 5. **Effects of Alternatives on Local Personal Income, Sage Hen Hills WSA (OR-1-146B) (1981 price levels)**

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Livestock Grazing	AUMs	no change	+249
Mineral Development:			
Metallic Mines	Number	no change	1
Recreation Use	RVD	no change	no change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES			
Livestock Grazing	$	0	+3,000
Mineral Development:			
Metallic Mines	$	0	unknown
Recreation Use	$	0	0
Totals		0	+3,000



LEGEND

■ Sage Hen Hills WSA

▨ Other BLM WSA's

░ Administratively Endorsed for Wilderness Designation in Charles Sheldon National Wildlife Refuge (U.S. Fish and Wildlife Service)

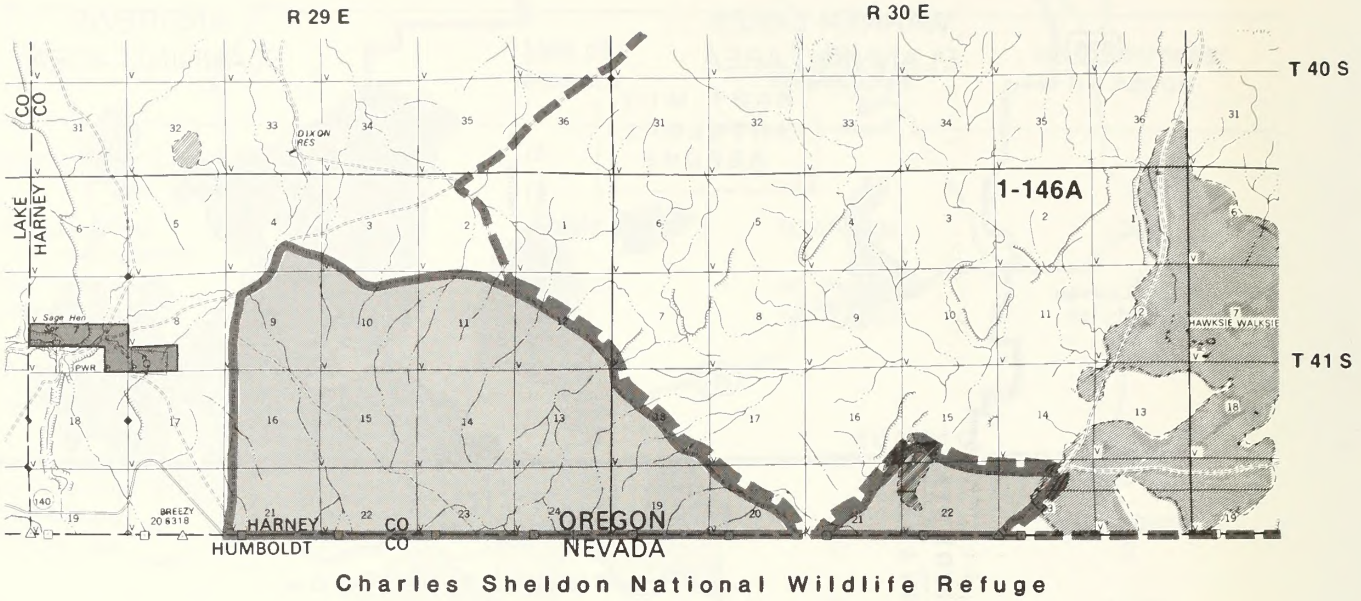
U. S. Department of the Interior
Bureau of Land Management
Lakeview District

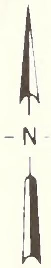
Sage Hen Hills
OR-1-146B

LOCATION MAP

10 0 10 MILES

MAP 1





LEGEND

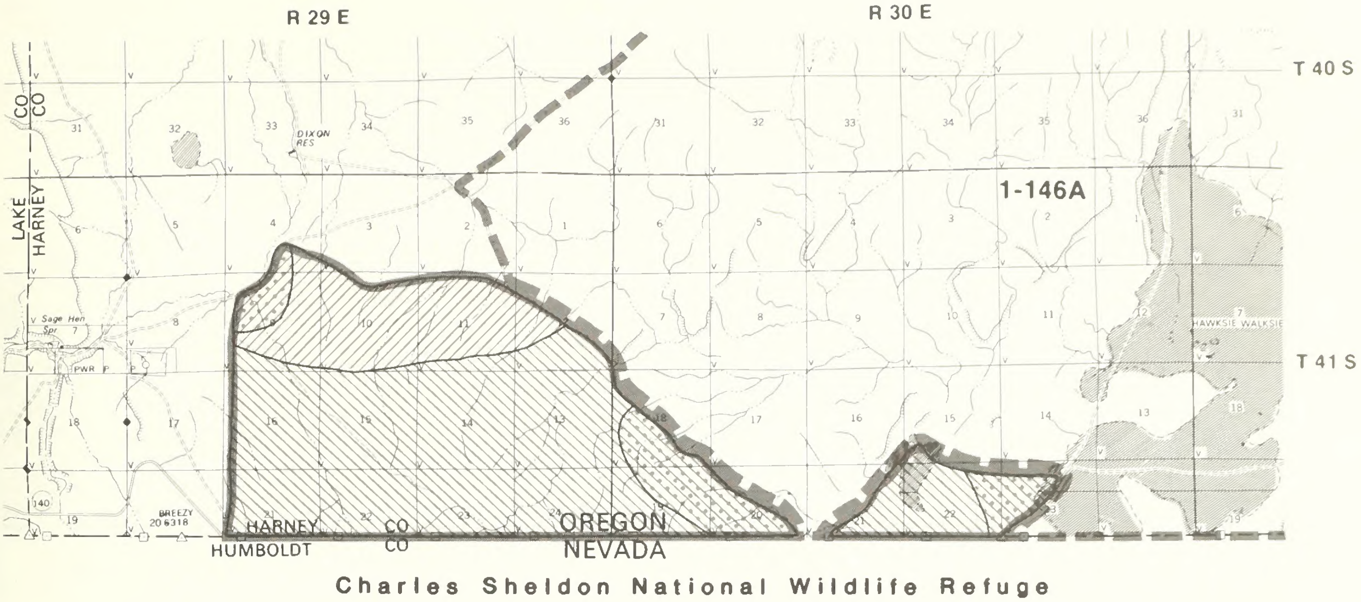
- ▨ BLM Land Studied Under Section 202 of FLPMA
- — Wilderness Study Area Boundary
- - - Boundary of Adjacent Wilderness Study Area
- ☐ Bureau of Land Management
- ■ Private

U. S. Department of the Interior
Bureau of Land Management
Lakeview/Burns Districts

Sage Hen Hills WSA
OR-1-146B

LAND OWNERSHIP

MAP 2



▨ **Moderate Potential (MB) for Gold, Silver, Copper and Mercury**

▧ **Moderate Potential (MA) for Gold, Silver, Copper and Mercury**

⁘ **Moderate Potential (MA) for Diatomite**

U. S. Department of the Interior
Bureau of Land Management
Lakeview/Burns Districts

Sage Hen Hills WSA
OR-1-146B

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 3

Sage Hen Hills WSA, OR-1-146B. Big sage community in the north-central portion of the WSA, looking south. June 1986.

Sage Hen Hills, OR-1-146B. Mixed sage flat on the northern boundary of the WSA, looking east. June 1986.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Thirtymile (OR-5-1) and Lower John Day (OR-5-6) Wilderness Study Areas

1. Introduction

General Description of Study Area

The Thirtymile Wilderness Study Area (WSA) is located along 8.5 miles of the John Day River approximately 20 miles northwest of Fossil, Oregon, 110 miles southeast of Portland, Oregon, and 40 miles southeast of The Dalles, Oregon (see Map 1). The Lower John Day WSA borders the Thirtymile WSA on the north and extends northward for approximately 29 river miles of the John Day River. The river forms the boundary between Sherman and Gilliam Counties within both WSAs.

Both WSAs encompass the John Day River and are basically oblong in shape and lie in a northwest-southeast direction (see Map 2). The Thirtymile WSA ranges 2 to 5 miles in width east to west, and is 5 miles long. The Lower John Day WSA is approximately the same width and is almost 8 miles long.

There are 7,538 acres of public land within the Thirtymile WSA. A 40-acre parcel of private land is located at the end of a dead-end road. The parcel is not inside the WSA because the WSA boundary extends along the dead-end road, but the parcel is surrounded by BLM land.

There are 19,587 acres of public land within the Lower John Day WSA including 120 acres of split-estate land and 160 acres of private inholdings. In addition, 160 acres of private land are located at the end of a dead-end road. The parcel is not inside the WSA because the WSA boundaries extend along the dead-end road but the parcel is surrounded by BLM land.

Two other parcels of private land totaling 320 acres and two dead-end roads totaling 2.6 miles separate the two WSAs. These two parcels of private land form a portion of the northern boundary of the Thirtymile WSA and the southern boundary of the Lower John Day WSA. Private lands surround most of both WSAs, and private land and a road separate them.

The eastern and western boundaries of both WSAs are formed by several primitive roads and adjacent private and public lands. Private, public and State lands border the Lower John Day WSA on the north. The southern boundary of the Thirtymile WSA is formed by a legal section line (used to divide this WSA from other BLM public land determined not to possess wilderness values.)

A dead-end road 1.6 miles long enters the Lower John Day WSA forming part of the boundary.

The only legal public access to either WSA is by floating the John Day River. A put-in point is located at Clarno where State Highway 218 crosses the John Day River and a take-out point is at Cottonwood Bridge where State Highway 206 crosses the river.

The Thirtymile and Lower John Day WSAs both contain several springs. The Lower John Day WSA also contains four perennial tributaries to the John Day River. Vegetation in both WSAs is a big sagebrush/bunchgrass community. Juniper trees are scattered throughout the area. Side canyons with springs have small riparian zones containing thickets of chokecherry, red osier dogwood, mock orange, poison ivy and water birch.

Interrelationships

A 147-mile stretch of the John Day River, including the segment passing through the WSAs, has been designated as a recreational component of the National Wild and Scenic Rivers System. This same river segment is also an Oregon State Scenic Waterway which provides some state control over private land use changes within 0.25-mile of the river.

A 0.5-mile wide corridor (0.25-mile on each side of the John Day River), extending from Thirtymile Creek downstream to the confluence of the John Day River with the Columbia River, has been designated by Oregon State law as the John Day River Wildlife Refuge. No waterfowl hunting is allowed within this area. This affects some 2,720 acres in the Thirtymile WSA and 9,320 acres in the Lower John Day WSA.

Portions of both WSAs near the John Day River are part of a power site reserve which identifies the land for potential water power and water storage development. This "withdrawal" is scheduled for review in the next few years which may lead to its revocation. Power site development is not foreseen and therefore is not discussed further. (See the Statewide EIS Volume.)

Both WSAs are entirely within lands ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. This treaty reserved to the Indians rights for hunting, fishing and gathering in usual and accustomed places and grazing stock on unclaimed land.

These WSAs are located within the Oregon Department of Fish and Wildlife's (ODFW) Biggs Wildlife Unit. The Lower John Day WSA supports approximately 320 mule deer, spring to fall, and the Thirtymile WSA supports approximately 110 mule deer, spring to fall. The majority of winter use occurs out of the WSAs. The present mule deer population in this unit is at its management objective level. The management objective for nongame wildlife is to maintain populations of naturally-occurring species at self-sustaining levels. One introduced game species, the chukar partridge, is to be managed at self-sustaining levels also. The California bighorn sheep, a Federal candidate for listing under the Endangered Species Act, is proposed to be reintroduced into the WSA. Since no developments are planned as part of this reintroduction, there would be no effect on bighorn sheep under any of the alternatives. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife.

Sherman and Gilliam counties have not identified any conflicts between the proposed action and the counties' comprehensive plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review processes. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSAs, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- impact on the areas wilderness values, including outstanding opportunities for solitude and primitive recreation and special features including the John Day River, botanic values, fisheries habitat, archaeological values and outstanding scenery;
- impact on livestock grazing use levels and management;
- impact on energy and mineral development;
- impact on mule deer habitat and anadromous fish habitat;
- impact on recreation use levels.

Also identified as an issue was the intensive fire management and visitor control programs (including search and rescue) that might be needed as well as the potential for increased trespass and vandalism on private lands due to increased visitor use under wilderness designation. (The potential for increased trespass, litter and vandalism on private lands due to wilderness designation and control of these undesirable activities is a major concern to local landowners.) This issue is not addressed because substantial visitor use increases are not expected to result from designation.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness
- proposed action
- partial wilderness
- no wilderness/no action

An opportunity exists to close the road separating Thirtymile and Lower John Day WSAs and manage them as a single unit if they both were designated wilderness. There is also the opportunity to add newly acquired non-WSA public lands on the north end of the Lower John Day WSA. These opportunities are analyzed under the proposed action.

An enhanced alternative is not analyzed because no other feasible opportunity exists to substantially enhance wilderness values beyond those analyzed in the all wilderness or proposed action alternatives.

Another alternative considered but not analyzed is the possibility of recommending the 1,750 acres of public land between the North Pole Ridge WSA (OR-5-8) and the Thirtymile WSA suitable as wilderness and combining the Lower John Day, Thirtymile and North Pole Ridge WSAs into one larger area. This alternative was considered in earlier phases of the study process and determined not to be feasible because of the existing 36-inch, buried gas pipeline and adjacent constructed maintenance road which separates the North Pole Ridge WSA from the Thirtymile WSA. Use and maintenance of this road will continue and possibly increase with construction of an additional pipeline through this area in the future.

All Wilderness

Under this alternative, all 7,538 acres and all 19,587 acres of public land in the Thirtymile WSA and Lower John Day WSA, respectively, would be recommended suitable as wilderness (see Map 2). The western and northern boundaries of the Lower John Day WSA would be private land and the eastern boundary would be a combination of a low standard dirt road and private land. The southern boundary would be formed by two low standard dirt roads which provide access to two tracts of private land adjacent to the John Day River which also forms a part of the boundary.

The boundary of the Thirtymile WSA would be formed by private land on the west, south and east. The northern boundary would be formed by the same low standard dirt roads and private land which form the southern boundary of the Lower John Day WSA. The WSAs would be managed as separate wilderness areas. For purposes of analysis, it is assumed the 40 acres of private land in the Thirtymile WSA, 320 acres of private land in the Lower John Day WSA and the mineral estate of 120 acres of split-estate land would not be acquired. The dead-end low standard road entering the Lower John Day WSA would remain open to vehicles. A total of 9.8 miles of ways (2.5 miles in the Thirtymile WSA and 7.3 miles in the Lower John Day WSA) would be closed to motorized vehicles. The John Day River within the WSAs, totaling 37.5 miles, would be closed to motorized watercraft in coordination with the Oregon State Marine Board.

Energy and Mineral Development Actions

Wilderness designation would close 7,538 acres in the Thirtymile WSA and 19,467 acres in the Lower John Day WSA to mineral entry. Split-estate land totaling 120 acres would be open to mineral exploration and development. In addition, 40 acres of private inholdings in the Thirtymile WSA and 320 acres in the Lower John Day WSA would remain open to mineral exploration and development at the landowner's discretion. Surface-disturbing exploration and development of metallic minerals would be prohibited on a total of 27,005 acres. This is 8,672 acres more than are already protected by the existing "no surface

occupancy" stipulation for energy leasing.
The 120 acres of split-estate lands within the Lower John Day WSA have moderate potential for oil and gas, and casual exploration would be expected. However, in the absence of known developable oil and gas deposits, development is not anticipated on this small parcel. There are no other minerals with moderate or high potential on the 120 acres of split-estate, therefore no development is projected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLMs Wilderness Management Policy. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Prescribed burning of 2,500 acres (2,000 acres Lower John Day, 500 acres Thirtymile) to maintain the natural condition of fire-dependent ecosystems would occur. Due to human safety factors, wildfires would be aggressively fought within the WSAs. If wildfires were allowed to burn, the potential for escape onto private agricultural land would be extremely high. These 2,500 acres would replace those acres which would be expected to burn naturally. Bighorn sheep are proposed for reintroduction into the WSAs.

Livestock Management Actions

Livestock use within portions of four allotments in the Thirtymile WSA would remain at the current level of approximately 406 AUMs and at approximately 804 AUMs in portions of 13 grazing allotments in the Lower John Day WSA. The season of use for the allotments would remain as identified in Table 4. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 2.5 miles of ways in the Thirtymile WSA and 7.3 miles of ways in the Lower John Day WSA. The 1.6 miles of dead-end road in the Lower John Day WSA would remain open. Livestock management and maintenance of 11.8 miles of fence and four springs in both WSAs would be conducted primarily from horseback. A total of 10.5 miles of riparian fence (two miles in the Thirtymile WSA and 8.5 miles in the Lower John Day WSA) would be constructed to improve the ecological status of the riparian zones on the John Day River and portions of Jackknife and Little Ferry canyons. For purposes of analysis it is assumed the fence would be allowed since it would not accommodate increased grazing but is necessary to protect and manage the wilderness resource by protecting the riparian areas from continued degradation by livestock.

Recreation Management Actions

The entire 7,538 acres in the Thirtymile WSA and 19,587 acres in the Lower John Day WSA would be closed to vehicle use. A total of 9.8 miles of ways (2.5 miles in Thirtymile WSA and 7.3 miles in the Lower John Day WSA) would be closed to motorized vehicles. A total of 1.6 miles of dead-end road in the Lower John Day WSA would remain open to vehicular use. At present, vehicle use is limited to these roads and ways within the WSAs. Vehicle access is available only to adjacent landowners and guests due to intervening private land. All 37.5 miles of the John Day River would be closed to motorized watercraft use. Current recreation use is estimated to be 15,000 visitor days per year consisting of significant river floating and bass fishing activities in May and June, hunting in the fall and steelhead fishing in the late fall and winter months. The John Day River provides the only legal access to public land in the WSAs.

Proposed Action

Under the proposed action a portion of the Lower John Day WSA (17,831 acres) plus 2,433 acres of newly-acquired land would be combined with a portion of the Thirtymile WSA (7,332 acres) to form a single wilderness area totaling 27,596 acres of public land (see Map 3). In addition, the mineral estate of 120 acres of split-estate land, 520 acres of private land in the Lower John Day WSA and 320 acres of private land between the two WSAs would be acquired through purchase or exchange with willing landowners. Assuming acquisition of these parcels, the total area recommended suitable under this alternative would be 28,556 acres. The two dead-end roads between the WSAs and the dead-end roads in the Lower John Day WSA, together totaling 6.2 miles, and 15.8 miles of ways would be closed (assuming acquisition of the private land). The John Day River (45.5 miles) would be closed to motorized watercraft, in coordination with the Oregon State Marine Board.

The boundary of the WSA would consist of private land on the south and west, a combination of private land and a low standard dirt road forming the east boundary and a combination of private land, roads and a fence forming the north boundary.

A total of 1,962 acres (206 acres in the Thirtymile WSA and 1,756 acres in the Lower John Day WSA) would be recommended nonsuitable for wilderness under this alternative.

Energy and Mineral Development Actions

Wilderness designation would close 28,556 acres to energy and mineral entry, assuming acquisition of the mineral estate of 120 acres of split-estate land and 840 acres of private land. This is 10,109 acres more than are currently protected by an existing "no surface occupancy" stipulation for the suitable area. A total of 1,962 acres recommended as nonsuitable would be open to energy and mineral entry, subject to the existing "no surface occupancy" lease stipulation.

Exploration and development for oil and gas would be permitted within the 1,756 acres of Lower John Day WSA recommended as nonsuitable, but it would not be permitted within the 206 acres of the Thirtymile WSA recommended nonsuitable, due to the existing restrictive lease stipulations which does not allow surface occupancy within view of the John Day River. Wilderness designation would preclude exploration and development of the moderate potential metallic mineralization in the WSAs.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy in the suitable portion. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Prescribed burning of 3,200 acres (2,700 acres Lower John Day, 500 acres Thirtymile) to maintain fire-dependent ecosystems would be carried out. Due to human safety factors, wildfires would be aggressively fought within the WSAs. If wildfires were allowed to burn, the potential for escape onto private agricultural land would be extremely high. These 3,200 acres would replace those acres which would be expected to burn naturally. Bighorn sheep are proposed for reintroduction into the WSAs.

Livestock Management Actions

Livestock use in portions of four allotments in the Thirtymile WSA would remain at the current use level of approximately 406 AUMs and 804 AUMs in portions of 13 grazing allotments in the Lower John Day WSA with 125 AUMs being allocated in the 2,433 acres of newly-acquired land which is being added. The season of use for the allotments in both WSAs would remain as identified in Table 4. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 2.5 miles of ways in the Thirtymile WSA, and on 13.3 miles of ways and 3.6 miles of dead-end road in the Lower John Day WSA. The dead-end boundary roads between the WSAs, totaling 2.6 miles, would also be closed. Livestock management and maintenance of 12 miles of fence and four springs in both WSAs would be conducted primarily from horseback. In the area recommended suitable for wilderness, a total of 12.8 miles of riparian fence (two miles in the Thirtymile WSA and 10.8 miles in the Lower John Day WSA) would be constructed to improve the ecological status of the riparian zones on the John Day River and portions of Jackknife and Little Ferry canyons. For purposes of analysis, it is assumed the fence would be allowed since it would not accommodate increased grazing, but is necessary to protect and manage the wilderness resource by protecting the riparian areas from continued degradation by livestock. In the portions of the Lower John Day WSA recommended nonsuitable for wilderness, 0.7 mile of riparian fence would be constructed in Jackknife Canyon.

Recreation Management Actions

Under the proposed action, 7,332 acres in the Thirtymile WSA and 20,264 acres in the Lower John Day WSA would be closed to vehicle use. A total of 15.8 miles of ways and 6.2 miles of road (3.6 miles of dead-end interior road in the Lower John Day WSA and 2.6 miles dead-end road between the WSAs) would be closed. A 200-acre finger of private land in the north end of the Lower John Day WSA and other private inholdings and private land between the two WSAs totaling 840 acres would be acquired. The John Day River within the WSAs would be closed to motorized watercraft. The access to public lands would be limited to boat access or foot access with special permission from the private land owners that control access to the upper reaches of the WSA. This would limit access for hunting and steelhead fishing since water flows are normally too low for boating, and vehicular access is available only to adjacent landowners and guests. Current recreation use is estimated to be 15,000 visitor days per year and includes whitewater boating, sightseeing, fishing and hunting. In the nonsuitable portion, a total of 1.9 miles of way would be open for vehicle use although access would continue to be controlled by private landowners.

Partial

Under this alternative, 5,686 acres of public land in the Thirtymile WSA and 12,767 acres of public land in the Lower John Day WSA (total 18,453 acres) would be recommended suitable as wilderness and managed as separate wilderness areas (see Map 4). The eastern and western boundaries would be formed by the "seen zone" from the surface of the John Day River and would generally follow the primary rim of the canyon. The northern and southern boundaries would be formed by private land. There would not be any private inholdings within the area recommended suitable for Thirtymile WSA, but 320 acres of private inholdings would remain in the Lower John Day WSA. For purposes of analysis, neither the private inholdings nor the mineral estate of the 120 acres of split-estate land would be acquired. The dead-end road in the Lower John Day WSA would remain open to vehicle use. A total of three miles of ways (0.6 mile in the Thirtymile WSA and 2.4 miles in the Lower John Day WSA) would be closed to motorized vehicle use. The 37.5 miles of the John Day River would be closed to motorized boats, in coordination with the Oregon State Marine Board.

A total of 8,672 acres (1,852 acres in the Thirtymile WSA and 6,820 acres in the Lower John Day WSA) would be recommended nonsuitable for wilderness under this alternative.

Energy and Mineral Development Actions

Wilderness designation would close 18,333 acres within the WSAs to energy and mineral entry. This is the same area currently unavailable for energy exploration or leasing due to existing "no surface occupancy" stipulations in the river canyon. The remaining 8,672 acres recommended as nonsuitable and 320 acres of private inholdings and 120 acres of split-estate land within the Lower John Day WSA would be open to energy and mineral entry.

Exploration for oil and gas would be permitted on 8,672 acres recommended as nonsuitable and on the 120 acres of split-estate land. Projected exploration and development would involve seismic surveys, drilling three wells and construction of approximately 1.5 miles of access road and pipeline. Total surface disturbance would be 10.5 acres in the nonsuitable portion of the WSAs. No development would be expected on the 320 acres of private inholdings.

In areas rated as moderate, anomalous geochemical concentrations indicate a potentially favorable geologic setting may exist for gold mineralization. It is projected that casual exploration would take place but due to the speculative nature of the occurrence no development is expected on the small area recommended as nonsuitable.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and BLM's Wilderness Management Policy in the suitable portion. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Prescribed burning of 2,500 acres (2,000 acres Lower John Day, 500 acres Thirtymile) to maintain fire-dependent ecosystems would be accomplished. Due to human safety factors, wildfires would be aggressively fought within the WSAs. If wildfires were allowed to burn, the potential for escape onto private agricultural land would be extremely high. These 2,500 acres would replace those acres which would be expected to burn naturally. Bighorn sheep are proposed for reintroduction into the WSAs.

Livestock Management Actions

Livestock use in portions of four allotments in the Thirtymile WSA would remain at the current use level of 406 AUMs and at 804 AUMs in portions of eight grazing allotments in the Lower John Day WSA. The season of use for the allotments in both WSAs would remain as identified in Table 4.

Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 3.0 miles of ways in both WSAs. Livestock management and maintenance of 5.6 miles of fence and four springs in both WSAs would be conducted primarily from horseback. A total of 9 miles of riparian fence (2 miles in the Thirtymile WSA and 7 miles in the Lower John Day WSA) would be constructed to improve the ecological status of the riparian zones on the John

Day River and portions of Jackknife and Little Ferry Canyons. For purposes of analysis it is assumed the fence would be allowed since it would not accommodate increased grazing, but is necessary to protect and manage the wilderness resource by protecting the riparian areas from continued degradation by livestock.

In the portion of the Lower John Day WSA recommended nonsuitable for wilderness, 1.5 miles of riparian fence would be constructed. A total of 6.8 miles of ways and 2 miles of roads would remain open to allow vehicle use to maintain 6.2 miles of fence.

Recreation Management Actions

Under this alternative, 5,686 acres in the Thirtymile WSA and 12,767 acres in the Lower John Day WSA would be closed to vehicle use. A total of 3 miles of ways would be closed. The 1.6 miles of road in the Lower John Day WSA and 6.8 miles of ways in both WSAs would be left open for vehicle use. Use would continue to be limited to adjacent private landowners and their guests. Motorized watercraft would be prohibited on all 37.5 miles of the John Day River within the WSAs.

Recreation use-levels in this area are estimated to be 15,000 visitor days per year for whitewater boating, hunting, fishing and sightseeing opportunities.

No Wilderness/No Action

The no wilderness/no action alternative would recommend all of both WSAs nonsuitable for wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Actions

All of the 27,125 acres (7,538 acres in the Thirtymile WSA and 19,587 acres in the Lower John Day WSA) would be open to mineral entry. The 8,672 acres that are located outside the area currently protected by restrictive “no surface occupancy” stipulations and the 120 acres of split-estate land would be open to energy entry.

A moderate potential for oil and gas would initially be explored by seismic surveys. Surface disturbance from these surveys would be negligible. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. Three wells would be anticipated requiring 1.5 miles of access roads and pipeline. Total surface disturbance would be 10.5 acres.

Approximately 3,240 acres with moderate potential for metallic mineralization are located in the WSAs. It is projected that exploration for these potential deposits would take place involving geochemical sampling with no surface disturbance. Due to the speculative nature of this occurrence, development is not expected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. The primary manner in which habitat would be managed would be through close coordination with livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Prescribed burning of 9,800 acres (7,000 acres Lower John Day, 2,800 acres Thirtymile) to maximize wildlife habitat diversity would be accomplished. Due to human safety factors, wildfires would be aggressively fought within the WSAs. If wildfires were allowed to burn, the potential for escape onto private agricultural land would be extremely high. Bighorn sheep are proposed for reintroduction into the WSAs.

Livestock Management Actions

Livestock use within portions of four allotments in the Thirtymile WSA would remain at the present level of 406 AUMs and at 804 AUMs in portions of 13 grazing allotments in the Lower John Day WSA. Grazing systems and/or changes in the present season of use would be implemented in most allotments to improve the condition of upland and riparian vegetation.

In addition, a total of 10.5 miles of riparian fence and 7.75 miles of management fence would be constructed. Seven springs would be developed. Approximately 1,500 acres of brush control through fire or other means would be implemented, primarily in early to mid-seral status sagebrush vegetation to remove the brush overstory and promote growth of understory grasses and forbs.

Vehicle use for livestock management and maintenance of fence and springs would continue on 9.8 miles of ways and 1.6 miles of roads. Most of livestock management and project maintenance would continue to be conducted on horseback.

Recreation Management Actions

Private vehicle use would continue on the 1.6 miles of road and 9.8 miles of ways in these two WSAs. Occasional motorized boat use would continue. The current recreation use level is estimated to be 15,000 visitor days per year for whitewater boating, hunting, fishing, and sightseeing.

Summary

Table 1 summarizes the projected management of the WSA under each alternative. Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Almost all portions of the Thirtymile and Lower John Day WSAs appear to be in a natural condition and primarily affected by the forces of nature. Forty-eight unnatural interior features (15 in the Thirtymile WSA and 33 in the Lower John Day WSA) influence approximately 17 percent of these two WSAs. The area of influence is an estimate of the acreage where these features can be seen.

Unnatural features in the Thirtymile WSA include 3.0 miles of fence, one spring development, an old wood cabin with a deteriorating corral and 2.5 miles of ways. In the Lower John Day WSA these features include 12.8 miles of fence, four spring developments, 1.6 miles of dead-end road and 7.3 miles of ways. In both areas these features are dispersed along the ridgetops, side canyons and isolated locations along the John Day River. These features generally do not dominate the landscape due to their type and size, topographic screening, the size and shape of these WSAs and the dispersal of these developments throughout the WSAs.

Occasional motorized boat use on the John Day River detracts from the naturalness as well as solitude within the WSAs. The noise of a boat motor can be heard for miles in the otherwise quiet canyon.

Unnatural features outside both WSAs that detract from naturalness include the sounds of the Kent natural gas booster station approximately 4 miles west of the Thirtymile WSA, periodic low elevation military jet flights in the canyon, occasional aircraft landings on a primitive private airstrip north of Horseshoe Bend and vehicle travel into two parcels of private land between these two WSAs. These sights and sounds are either temporary or not significant enough to seriously affect naturalness qualities of the WSAs.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Outstanding opportunities for solitude exist in most portions of both WSAs, particularly within the main canyon of the John Day River. There are also outstanding opportunities for solitude in most isolated side canyons within the boundaries of both WSAs. A unique type of solitude can be experienced by floating or hiking within this study area. The reddish brown Columbia River basalt canyons range in depth from 800 to 1,600 feet and totally engulf the visitor, giving one a complete feeling of being alone. Secluded spots outside the main canyon in the Thirtymile WSA are located in portions of Chisholm, Cordwood, Beef Hollow, Potlatch and two other unnamed canyons.

The Lower John Day WSA contains numerous secluded spots within its 23 side canyons, which total over 40 miles. Most of these isolated side canyons are rocky, relatively long and steep.

Outstanding opportunities for primitive recreation in both WSAs include whitewater boating on the John Day River by raft, drift boat, canoe or kayak during the late spring and early summer months (a period of three to four months depending on river levels.) This opportunity is outstanding because of a variety of fast-to-slow moving water, intermixed with a few moderately challenging rapids within the WSAs, outstanding scenic quality of the John Day River canyon; opportunities to fish, camp, and view wildlife and historic, geologic and archaeological sites and the opportunity to see an area that is predominantly unimpaired in its natural beauty and character.

In addition, opportunities exist to experience a two- to four-day river trip, or longer if desired, from Clarno to Cottonwood Bridge. While one can float through the study areas in a day or two, limited access to the river requires a longer trip.

Fishing opportunities for smallmouth bass, squawfish, bullhead, channel catfish, carp, chinook salmon and steelhead are available along the river within the WSAs. Outstanding day hiking opportunities exist in all six side canyons of the John Day River within the Thirtymile WSA and in 15 of the 23 side canyons within the Lower John Day WSA. Opportunities for sightseeing and photography are also outstanding in both WSAs. Thirtymile WSA offers opportunities for backpacking, camping, wildlife observation and hunting, but they are less than outstanding. Except for backpacking, these activities are also less than outstanding in the Lower John Day WSA.

Special Features

The Thirtymile and Lower John Day WSAs contain significant special wilderness features (see Map 2). Both WSAs lie within one of the largest continental basalt flow formations in the world, the Columbia River Basalt Formation. The John Day River cut a dramatic cross section through this plateau as it formed the John Day Canyon. The Thirtymile WSA contains 8.5 miles and the Lower John Day WSA contains 29 miles of the John Day River with scattered wet areas of lush vegetation which contrast against an otherwise dry landscape. The John Day River provides aquatic habitat for steelhead trout and chinook salmon (some of Oregon's last remaining native salmonid runs). Both WSAs contain prehistoric and historic sites which offer special opportunities for cultural resource studies. Some sites within the Lower John Day WSA are so significant that they are potentially eligible for designation as a district on the National Register of Historic Places. (See the Cultural Resources section for more information.) Both WSAs contain vegetation representative of a potential natural community (PNC) bluebunch wheatgrass ecosystem and three Federal candidate plant species. There are opportunities to study native range sites which could be useful for vegetative comparison and as pristine plant reserves. This could be beneficial for future genetic experiments. Both WSAs contain outstanding scenic qualities because of the cliffs, columns and pillars in the John Day River Canyon.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Thirtymile and Lower John Day WSAs are located in the Palouse Grassland Province and contain the sagebrush steppe and wheatgrass bluegrass ecosystems. Of the ecosystems listed in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan, the following occur in the WSAs: big sagebrush/bluebunch wheatgrass; big sagebrush/Idaho fescue; rigid sagebrush/Sandberg's bluegrass; bluebunch wheatgrass/Sandberg's bluegrass; and Idaho fescue/bluebunch wheatgrass.

There are six standard metropolitan statistical areas with five hours' driving time of these WSAs: Eugene/Springfield, Portland, and Salem, Oregon; and Richland/Kennewick/Pasco, Yakima and Tacoma/Seattle/Everett, Washington.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical rock chip sampling by the BLM. Technical details of the evaluation are found in a BLM report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Lower John Day River Geologic Resource Area."

The WSAs are located within the Lower John Day River geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral potential classifications for the WSAs. Map 5 shows where energy and mineral resources have moderate potential for occurrence in the WSAs.

The exposed rocks in the WSAs are Tertiary flood-type basalt flows. The subsurface rocks are inferred from oil and gas exploration wells to include Cretaceous marine clastic sediments and Pre-Cretaceous marine sediments and metamorphosed sediments.

Energy Resources

Oil and gas has a moderate potential for occurrence based on several factors. Several oil and gas exploration wells have been drilled south of the WSAs, with one of the wells recovering gas. In the same area there are three reported asphalt occurrences. Near Condon, a deep well had a slight oil show. The discovery of subcommercial gas in Washington state beneath the Columbia River Basalt Group indicates gas was generated and preserved in areas similar to the WSAs. The combination of surface and subsurface hydrocarbon shows, surface and subsurface geology and current oil and gas leasing all lead to a moderate potential for the occurrence of oil and gas in the WSAs.

As of October 16, 1987, a total of 9,240 acres were leased for oil and gas within the Lower John Day WSA and none in the Thirtymile WSA. There were no geothermal leases in the WSAs as of October 16, 1987.

Current management preserves the natural character of the area viewed from the John Day River ("seen" zone) from oil and gas exploration and development by use of "no surface occupancy" lease stipulations where the mineral estate is owned by the Federal Government. The 120-acre parcel of split-estate is not covered by this stipulation. There are 1,852 acres in the Thirtymile WSA and 6,820 acres in the Lower John Day WSA which are outside the area viewed from the river and are therefore not included in a "no surface occupancy" stipulation.

Mineral Resources

Rock chip samples indicate some moderate potential for mercury, zinc, lithium and gold in the Thirtymile WSA, but there is a lack of favorable indications for most minerals in the Lower John Day WSA. Zinc and mercury are strategic and critical minerals, however, no deposits of strategic and critical minerals are known to exist in the WSA. As of October 16, 1987, there were no mining claims within the WSAs.

Vegetation

The predominant vegetation in the WSAs is big sagebrush/bunchgrass with a few communities dominated by rabbitbrush or snakeweed. There is also a scatttering of juniper/big sagebrush communities along the John Day River.

The rolling hills and plateaus above the drainages are usually dominated by big sagebrush on deeper soils, with low and/or stiff sagebrush on shallower soils. Associated understory species include bluebunch wheatgrass, Thurber's needlegrass, Idaho fescue, squirreltail, Sandberg's bluegrass, cheatgrass, phlox, biscuitroot, buckwheat and aster.

The ecological status of these communities varies from early seral to late seral. Bunchgrass-dominant communities are generally found on some of the plateaus and most of the steep slopes of the river canyons. Some of these communities are in potential natural community (PNC) or late seral status. Livestock grazing in these zones is very limited or nonexistent. These communities consist mainly of bluebunch wheatgrass and big sagebrush with Idaho fescue on some of the north slopes.

Riparian vegetation is found along the John Day River and in small areas in Jackknife and Little Ferry Canyons, generally in early seral condition along the river but in mid-seral in the two tributaries. Plants include sedges, rushes, willow, mock orange, red osier dogwood, wild rose and blackberry. Riparian areas make up less than one percent of the public land in both WSAs.

The ephemeral drainages not supporting riparian vegetation are dominated by big sagebrush/bunchgrass communities with some juniper/big sagebrush/bunchgrass areas along the John Day River. They are generally in early seral status with a static trend.

Three plant species of special interest are suspected of occurring in the WSAs: *Castilleja xanthotricha* (yellow hairy Indian paintbrush), *Collomia macrocalyx* (bristle-flowered collomia), and *Rorippa columbiae* (Columbia cress). All are candidates for Federal listing as threatened or endangered.

Wildlife

Most wildlife habitat in these WSAs is in late seral status or potential natural community (PNC). Riparian habitats are the primary exception since they generally are in an early seral status. A representative sampling of species inhabiting the WSAs include: mule deer, chukar, golden eagles, prairie falcons, bobcats, tree and cliff swallows, long-earred owls, Canada geese, mallard ducks, redwinged blackbirds, beaver and mink. The bald eagle is a winter resident. Fisheries in this portion of the John Day River are significant with smallmouth bass, rainbow trout, steelhead and chinook salmon being the primary game species and northern squawfish, brown bullheads and suckers the most common nongame species. Spawning and rearing habitat for smallmouth bass, rainbow trout and steelhead occur in the Lower John Day WSA.

There is an extensive diversity of habitats within the WSAs provided by the mixed sagebrush/grass sidehills and rock outcrops of the canyon walls. Riparian habitat is found the entire length of the WSA along the John Day River and in several of the side canyons, including Buckskin, Little Ferry and Jackknife canyons. Most of this habitat is in an early seral stage.

Watershed

The Thirtymile WSA contains approximately 8.5 miles of the John Day River. The Lower John Day WSA contains approximately 29 miles of the John Day River plus Jackknife and Little Ferry canyons which have some perennial waters (1.0 miles for Jackknife and 1.2 miles for Little Ferry). Water quality of these streams is generally low. Watershed problems are generally related to the timing of livestock grazing and its effect on the riparian vegetation, bank stability and associated erosion.

Livestock Grazing

Portions of four allotments are in the Thirtymile WSA and portions of 13 are in the Lower John Day WSA. Table 4 summarizes existing livestock use in AUMs and percent of each allotment in each WSA.

The 2.5 miles of ways in the Thirtymile WSA and 1.6 miles of dead-end road and 7.3 miles of ways in the Lower John Day WSA are used primarily for livestock supervision, and inspection and repair of existing livestock developments (11.8 miles of fence and four springs). Day-to-day livestock management requires the use of horses due to the lack of vehicular access. Livestock operators make from 10 to 15 trips per year by vehicles into each WSA for livestock management.

Cultural Resources

Information about cultural resources in the WSAs was collected during field surveys in the John Day River Canyon in 1976 and has been updated from more recent monitoring trips. Forty-five cultural sites have been recorded in the Lower John Day WSA. The prehistoric sites include pithouse villages, rockshelters, pictograph sites, rock feature sites, a tool manufacturing site and a few buried sites whose character cannot be determined without scientific excavation. The historic sites include cabins that are associated with homesteading or stockraising, machinery left from a ferry crossing and a rockshelter used for a still. Five sites have been identified within the Thirtymile WSA, including two prehistoric pithouse villages, two historic cabins with corrals and a set of wagons left from a 1920s movie set. The prehistoric sites are potentially eligible as a district on the National Register of Historic Places.

Most of these sites have been vandalized. Illegal excavation of prehistoric sites and surface removal of historic sites by artifact collectors are presently the greatest threats to the cultural resources in these areas.

Recreation Use

Recreation use of both WSAs includes whitewater boating, fishing, hunting for upland gamebirds and deer, camping, sightseeing, photography and some day hiking and backpacking. The only legal access to public lands is by boating. Some hikers use the ways with permission from adjacent private landowners. A limited but increasing amount of motorized watercraft use is known to occur.

Overall recreation use in the WSAs is estimated to be 15,000 visitor use days per year with the majority of use being whitewater boating followed by fishing and hunting. Use levels are currently increasing by 5 to 10 percent per year. Use levels vary from year-to-year depending on the water flows. Most of the boating and bass fishing occurs in April, May and June. Chukar hunting occurs in October but access is difficult. Steelhead fishing occurs in November, December and January and seems to be increasing in popularity.

Local Personal Income

Livestock use at the current level of 1,210 AUMs and recreation use totaling 15,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $15,000 for livestock grazing and $180,000 related to recreation use of the WSA, for an overall total of $195,000. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The statewide volume discusses certain assumptions that were made for this analysis.

All Wilderness

Recommended suitable for wilderness:
Thirtymile WSA: 7,538 acres
Lower John Day WSA: 19,587 acres

Total: 27,125 acres

Recommended nonsuitable for wilderness:
Thirtymile WSA: 0 acres
Lower John Day WSA: 0 acres

Total: 0 acres

Impacts on Wilderness Values

Wilderness values within the entire 7,538 acres of the Thirtymile WSA and entire 19,587 acres of the Lower John Day WSA would be protected by legislative mandate through wilderness designation. Wilderness values such as naturalness, solitude, and primitive, unconfined recreation would be preserved.

Special features, including riparian areas, outstanding scenery and undeveloped plateaus and canyons, aquatic habitat for steelhead trout and chinook salmon and numerous historic/and prehistoric sites would be further protected.

Naturalness

The naturalness of the John Day Canyon and undisturbed canyons, side canyons and plateaus (83 percent of both WSAs is pristine, uninfluenced by any unnatural features) would be enhanced by prohibiting motorized watercraft and vehicle use. Closure of 9.8 miles of ways within both WSAs, influencing approximately 3,200 acres (12 percent of the combined acreage of both WSAs) would allow the ways to revegetate. The proposed riparian fences (two miles in the Thirtymile WSA and 8.5 miles in the Lower John Day WSA) along the John Day River and tributary side canyons would be allowed, because they would protect natural processes, restore deteriorated habitat and generally be compatible with the wilderness character of the area. The fence, an unnatural feature in itself, would visually influence approximately 800 acres within the immediate area along this river segment.

Prescribed burning to enhance wildlife habitat diversity on 2,000 acres within the Lower John Day WSA and 500 acres within the Thirtymile WSA would be noticeable in the short term. In the long term, naturalness would be improved through restoration of a fire-dependent ecosystem.

Solitude

Opportunities for solitude provided by the size of both WSAs, 37.5 miles of the John Day River and meandering river canyon, numerous side canyons and limited vehicle access would be further enhanced by eliminating motorized watercraft use on the John Day River and motor vehicle use on 2.5 miles of ways in the Thirtymile WSA and 7.3 miles of ways in the Lower John Day WSA. This reduction in vehicular access would provide a large interior area for visitors to hike into and experience solitude with little disturbance from vehicle use. Vehicles would be limited to the roads to private property on the west side of the John Day River between Buckskin and Fern Hollow canyons. Vehicle use on this road would reduce solitude within its immediate vicinity.

Primitive and Unconfined Recreation

Closure of the 9.8 miles of ways to motorized use would increase opportunities for primitive and unconfined recreation opportunities such as hiking, backpacking and camping. The quality of photography, sightseeing and hunting would also improve by eliminating vehicle use on these ways and rehabilitating them. A more natural and primitive setting would be provided. The 10.5 miles of riparian fence within both WSAs would also enhance hunting and fishing opportunities along the John Day River. Wildlife populations would increase as a result of improved habitat condition. Increased wildlife populations would then provide improved recreation opportunities in the form of hunting and wildlife viewing.

Special Features

Eliminating motorized vehicle use on 9.8 miles of ways within both WSAs would reduce impacts to special features by reducing soil compaction which impairs visual quality, by reducing access and potential vandalism to cultural sites, and by reducing disturbance to wildlife and the Federal candidate plant species. Riparian fences would cause short-term disturbance in the vicinity of the fences, however in the long term, they would result in enhancement of the scenic qualities.

Conclusion: Wilderness designation of 7,538 acres of the Thirtymile WSA and 19,587 acres of the Lower John Day WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 27,005 acres within the WSAs to mineral entry. The 120 acres of split-estate in the WSAs would be open to mineral exploration.

Energy Development

Surface-disturbing exploration and development of oil and gas in the WSAs would be prohibited on 27,005 acres. This is 8,672 acres more than are currently protected by restrictive lease stipulations. Projected development of three production wells would be precluded. The split-estate and private land would be open to energy exploration but development on this land would not be expected.

Conclusion: Production from three projected oil and gas wells would be foregone.

Mineral Development

Surface-disturbing exploration for metallic minerals on all 3,240 acres would be precluded. Due to the speculative nature of these deposits no development is projected.

Conclusion: No impacts to metallic mineral development is expected.

Impacts on Vegetation

For 2,500 acres treated by prescribed burning (500 acres in the Thirtymile WSA and 2,000 acres in the Lower John Day WSA), the bunchgrass communities in upper mid-seral to lower late-seral status would change to, or be maintained in, late seral status through the reintroduction of fire into the ecosystem. Exclusion of livestock from 9.2 miles of riparian areas as a result of 10.5 miles of fence construction would allow these areas to change from early seral to late seral status in the long term, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. This would occur along 7 miles of the John Day River, 1 mile of Jackknife Canyon and 1.2 miles of Little Ferry Canyon. Residual ground cover would increase in both the burned and excluded areas. The 9.8 miles of ways would begin to revegetate in two to three years.

Vegetation in the remainder of the WSAs (approximately 24,000 acres) would not change.

Conclusion: Seral status of 2,500 acres would change to, or be maintained in, late seral status through prescribed burning. Riparian vegetation on 9.2 miles of stream would change toward late seral status in the long term.

Impacts on Wildlife

Wildlife habitat and forage for approximately 430 mule deer and other wildlife species would be maintained under wilderness designation. Disturbances to wildlife would be reduced through closure of 9.8 miles of ways to motorized vehicles. Habitat conditions for wildlife and fish would improve along 9.2 miles of stream through construction of 10.5 miles of riparian fence and the subsequent exclusion of livestock. Minor negative impacts on deer movement would be incurred as a result of this fencing. Habitat diversity would be maintained through 2,500 acres of prescribed burning.

Conclusion: Wildlife habitats and populations would be maintained on 27,125 acres designated wilderness. Riparian habitat along 9.2 miles of the John Day River and tributaries would be improved.

Impacts on Watershed

Streambank stabilization and sedimentation would improve through exclusion of livestock on the John Day River (7 miles) and in Jackknife and Little Ferry canyons. In these canyons (2.2 miles), the increase in riparian vegetation would also improve water quantity and quality and lower the water temperatures. Fecal coliform bacteria from livestock would be reduced.

There would be little change in watershed conditions over the rest of the two WSAs.

Conclusion: Water-related conditions along the John Day River and in Jackknife and Little Ferry canyons would improve through livestock exclusion.

Impacts on Livestock Grazing

Livestock use would remain at the present level of approximately 406 AUMs in the Thirtymile WSA and 804 AUMs in the Lower John Day WSA.

Vehicle use for livestock management and facility inspection/maintenance on 9.8 miles of ways in both WSAs would be precluded resulting in slight inconvenience and expense to the livestock operators.

Conclusion: There would be no impact to levels of livestock grazing. Vehicle use of 9.8 miles of ways would be precluded with some inconvenience and additional expense to the livestock operators.

Impacts on Recreation Use

Vehicular access by anglers and hunters who had special permission from the private landowners above the canyon rims would be eliminated with the closure of the 9.8 miles of ways. Motorized boat use would also be precluded which would further reduce recreation use levels. This would amount to an estimated 200 visitor use days per year. There would be a slight increase in the number of people seeking out wilderness values of the area. Non-motorized boating use would increase at a rate of 5 to 10 percent per year as the area becomes better known for its float trips and fishing.

Conclusion: The area's recreation use level of 15,000 visitor days per year would decrease by 200 visitor days per year in the short term. In the long term, the visitor use level would not be affected and the visitor use would continue to increase at a rate of 5 to 10 percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 1,210 AUMs. Overall recreation use would remain at 15,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $195,000.

Proposed Action

Recommended suitable for wilderness:

Thirtymile WSA: 7,332 acres
Lower John Day WSA: 20,264 acres (21,224 assuming acquisition of 840 acres of private land and 120 acres of split-estate land)

Total: 27,596 acres

The two WSAs would be combined for a total of 27,596 acres (28,556 acres assuming acquisition of 320 acres of private land within the lower John Day WSA, a 200-acre finger of private land in northern end of the Lower John Day WSA and acquisition of 320 acres of private land between the WSAs along with 120 acres of split-estate land).

Recommended nonsuitable for wilderness:

Thirtymile WSA: 206 acres
Lower John Day WSA: 1,756 acres

Total: 1,962 acres

Impacts on Wilderness Values

The proposed action alternative would combine portions of both WSAs, include 2,433 acres of newly-acquired non-WSA public land and add 28,556 acres to the NWPS, assuming acquisition of 520 acres of private land within the Lower John Day WSA and 320 acres between the WSAs. The mineral estate on 120 acres of split-estate land would also be acquired. A total of 15.8 miles of ways would be closed as well as 6.2 miles of road (3.6 miles of dead-end road within the Lower John Day WSA and 2.6 miles of dead-end road between the WSAs). Motorized watercraft use would be prohibited on 45.5 miles of the John Day River.

Most of both WSAs would be designated wilderness and wilderness values in these two areas would be protected by legislative mandate.

Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including riparian zones, cultural resources, fisheries habitat for steelhead and chinook salmon, vegetative communities and outstanding scenery would continue to be protected. Acquisition of 840 acres of private land and 120 acres of subsurface mineral estate would prevent possible disturbance from energy or mineral exploration and ensure the preservation of naturalness and opportunities for solitude and primitive and unconfined recreation.

The remaining 206 acres within the Thirtymile WSA and 1,756 acres within the Lower John Day WSA recommended nonsuitable for wilderness would not receive special legislative protection. The limited wilderness values of naturalness, solitude and primitive unconfined recreation would be vulnerable to the effects of other resource management actions, such as energy and mineral exploration.

Naturalness

For the 28,556 acres recommended suitable for wilderness, the effects on naturalness would be similar to the all wilderness alternative except the proposed action would include the addition of 2,433 acres of non-WSA public land, the acquisition of 840 acres of private land and 120 acres of mineral estate and the closure of 6.2 miles of roads. Impacts from mineral exploration or other activities affecting naturalness would not occur and the naturalness of the area would be preserved.

Closing 15.8 miles of ways and 6.2 miles of road within and between the WSAs would allow revegetation and eventually eliminate their unnatural influence on approximately 7,200 acres. Prescribed burning to maintain fire-dependent ecosystems on 500 acres within the Thirtymile WSA and 2,700 acres within the Lower John Day WSA would be apparent in the short term.

These treatments would eventually improve naturalness through restoration of a fire-dependent ecosystem.

The riparian fence along portions of the John Day River and tributary side canyons would enhance riparian habitat but add the unnatural feature of 10.8 miles of fence in the Lower John Day and 2.0 miles of fence in the Thirtymile WSA, visually influencing approximately 1,000 acres.

Within the Thirtymile and Lower John Day WSAs, 206 acres and 1,756 acres, respectively, would be recommended nonsuitable for wilderness. Although wilderness values in these areas are limited, naturalness would be vulnerable to resource management actions such as energy and mineral exploration.

Solitude

For the area recommended suitable for wilderness the effects on solitude would be similar to the all wilderness alternative except that an additional 2,433 acres of non-WSA public land would be included. In addition, eliminating vehicle use on 6.2 miles of road as well as on 15.8 miles of ways and not allowing mineral entry and surface-disturbing exploration on the 840 acres of private land and 120 acres of split-estate lands would significantly enhance solitude opportunities.

In the 1,962 acres recommended nonsuitable for wilderness, continued vehicle use on 0.2 mile of ways and some human activities associated with energy and mineral development would cause some impairment to the limited opportunities for solitude within and adjacent to areas where these activities would occur.

Primitive and Unconfined Recreation

Within the area recommended suitable for wilderness, a similar increase in opportunities for primitive and unconfined recreation as in the all wilderness alternative, resulting from closure of 15.8 miles of ways and riparian fence construction, would occur. In addition, acquisition of the private inholdings between the WSAs and the closure of 6.2 miles of road between and within the WSAs would result in an increase in opportunities for primitive and unconfined recreation activities such as photography, nature study, rafting, backpacking and camping. The quality of these experiences would be improved by adding the 2,433 acres of non-WSA public land and removing vehicles and allowing these vehicle access routes to revegetate, resulting in a more natural appearing area. Acquisition of the 840 acres of private land and 120 acres of subsurface mineral estate would prevent mineral entry and surface-disturbing exploration thus preserving a natural setting for primitive recreational pursuits.

In the area recommended nonsuitable for wilderness, limited opportunities for primitive, non-motorized recreation would continue.

Special Features

The impacts to special features would be similar to the impacts identified in the All Wilderness alternative but would be enhanced by the addition of 2,433 acres of non-WSA land and the acquisition of 840 acres of private land and 120 acres of split-estate lands. The closure of 6.2 miles of dead-end roads would enhance special features by eliminating vehicle access to the John Day River. Mineral entry and surface-disturbing exploration would be precluded on these lands and areas remaining in a natural condition and containing scenic values such as the John Day River canyon would remain in their present condition.

The closure of 15.8 miles of ways would eliminate soil compaction, disturbance to wildlife and the impairment of scenic values and cultural sites. The riparian fences would result in enhancement of the scenic qualities and an increase in viewable wildlife. Special features would not be affected in the area recommended nonsuitable for wilderness since none are known to exist.

Conclusion: Wilderness designation of 7,332 acres in the Thirtymile WSA and 20,264 acres in the Lower John Day WSA and closure of 6.2 miles of boundary and interior roads would protect and enhance existing wilderness values. The acquisition of 840 acres of private land and 120 acres of mineral estate would further enhance the area recommended as suitable by preserving wilderness values on all lands within the proposed wilderness boundary.

The 1,962 acres recommended as nonsuitable for wilderness would be vulnerable to oil, gas and mineral exploration and further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 28,556 acres to energy and mineral entry, assuming acquisition of 840 acres of private land and 120 acres of mineral estate. Of the remaining 1,962 acres recommended as nonsuitable, the 1,756 acres in the Lower John Day WSA located out of view of the John Day River would be open for energy and mineral entry. The 206 acres in the Thirtymile WSA would be open for mineral entry but closed to energy development as a result of existing "no surface occupancy" stipulations.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 28,556 acres by wilderness designation (assuming acquisition of 840 acres of private land and 120 acres of split-estate land) and on 206 acres through existing restrictive stipulations. This is 7,676 acres more than is currently protected by restrictive lease stipulations. Projected development of three production wells would be precluded.

Conclusion: Production from three projected oil and gas wells would be foregone.

Mineral Development

Surface-disturbing exploration for metallic minerals would be precluded on all 3,240 acres classified as having moderate potential for the presence of metals. Due to the speculative nature of these deposits, no development of these deposits is projected.

Conclusion: No impacts to metallic mineral development is expected.

Impacts on Vegetation

In the area recommended suitable for wilderness, 2,700 acres treated by prescribed burning (500 acres in the Thirtymile WSA and 2,200 acres in the Lower John Day WSA) would change from mid-seral status to late seral status or remain in late seral status through the reintroduction of fire into the ecosystem. Exclusion of livestock from riparian areas would allow these areas to change from early seral to late seral status in the long term, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. This would occur along 9 miles of the John Day River, 0.75 mile of Jackknife Canyon and 1.2 miles of Little Ferry Canyon. Residual ground cover would increase in both the burned and excluded areas. The 15.8 miles of ways and 6.2 miles of road (including 3.6 miles of dead-end road in the Lower John Day WSA and 2.6 miles of dead-end road between the WSAs) would begin to revegetate in two to three years. The remainder of the WSAs (approximately 25,000 acres) would not change.

Upland vegetation on the 1,962 acres recommended nonsuitable for wilderness would not change. Fence construction would allow riparian vegetation on 0.25 mile of Jackknife Creek to change from early seral status to late seral status in the long term, with a corresponding increase in residual ground cover.

Conclusion: For the area recommended suitable for wilderness, seral status of 2,700 acres would change to or be maintained in late seral status through prescribed burning. Riparian vegetation on 11 miles of stream would change toward late seral status in the long term. For the area recommended nonsuitable for wilderness, riparian vegetation on 0.25 mile of stream would change from early seral status to late seral status in the long term.

Impacts on Wildlife

In the area recommended suitable for wilderness, wildlife habitat and forage for 400 mule deer and other wildlife species would be maintained. Disturbances to wildlife would be reduced through closure of 15.8 miles of ways and 6.2 miles of roads to motor vehicles. Habitat conditions for wildlife and fish along 11 miles of stream would improve through construction of 12.8 miles of riparian fence and the subsequent exclusion of livestock. Minor negative impacts on deer movement would be incurred as a result of this fencing. Habitat diversity would be maintained through 3,200 acres of prescribed burning.

In the area recommended nonsuitable for wilderness, wildlife habitat and forage for 30 mule deer and other wildlife species would be maintained. Habitat conditions for wildlife and fish along 0.25 miles of Jackknife Canyon would improve through construction of .7 miles of riparian fence and subsequent livestock exclusion.

Conclusion: Wildlife habitats and populations would be maintained on 27,596 acres designated wilderness. Riparian habitat along 11 miles of stream would be improved.

Impacts on Watershed

In the area recommended suitable for wilderness, streambank stabilization and sedimentation would improve through exclusion of livestock use along 11 miles of the John Day River and Jackknife and Little Ferry canyons. In Jackknife and Little Ferry canyons, the increase in riparian vegetation would also improve water quantity and quality and lower the water temperatures. Fecal coliform bacteria from livestock would be reduced. There would be little change in watershed conditions over the rest of the area.

Upland watershed conditions would not change on the 1,962 acres recommended nonsuitable for wilderness. Streambank stabilization, water quantity and quality, and water temperature would improve on 0.25 mile of Jackknife Canyon excluded from livestock grazing, and there would be a reduction of sedimentation and fecal coliform bacteria.

Conclusion: Water-related conditions along the John Day River and in Little Ferry and Jackknife canyons would improve through livestock exclusion along 11 miles of stream within the suitable area and 0.25 mile in nonsuitable area.

Impacts on Livestock Grazing

In the 28,556 acres recommended suitable for wilderness, livestock use would remain at the present level of approximately 392 AUMs in the Thirtymile WSA and increase to 929 AUMs in the Lower John Day WSA due to the addition of 2,433 acres of newly-acquired land.

Vehicle use for livestock management and facility inspection maintenance on 15.8 miles of ways and 6.2 miles of dead-end interior and boundary roads would be precluded, resulting in some inconvenience and expense to the livestock operators.

For 1,962 acres recommended nonsuitable for wilderness, livestock use levels would remain at 28 AUMs (14 AUMs in each WSA).

Conclusion: There would be no impact to levels of livestock grazing. Vehicle use would be precluded on 15.8 miles of ways and 6.2 miles of dead-end road, resulting in some inconvenience and expense to the livestock operators.

Impacts on Recreation Use

Under the proposed action, the closure of 6.2 miles of road and 15.8 miles of ways would reduce recreation use by the hunters and anglers who had obtained special permission from private landowners to use these access routes to get to the public land in the WSAs. The addition of 2,433 acres of non-WSA public land would contribute an additional 2,000 visitor days of use per year to the WSA. Recreation use levels would be reduced with the elimination of motorized boat use on the river. Overall visitor use levels would be expected to decrease by 300 visitor days per year as a result of precluding motorized vehicles and boats.

A natural setting for primitive recreational pursuits would be preserved by the acquisition of the mineral estate on 120 acres of split-estate land and acquisition of 840 acres of private inholdings, a finger of private land, and private land between the WSAs. In the long term there would be an increase in non-motorized visitor use by those seeking wilderness values of the area.

Conclusion: The area's recreation use level of 15,000 visitor days per year plus approximately 2,000 visitor days of annual recreation use on the non-WSA level would decrease by 300 visitor days per year in the short term. In the long term, the visitor use level would not be affected and use levels would continue to increase at a rate of 5 to 10 percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 1,210 AUMs. Overall recreation use would remain at 15,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $195,000.

Partial

Recommended suitable for wilderness:
Thirtymile WSA: 5,686 acres
Lower John Day WSA: 12,767 acres

Total: 18,453 acres

Recommended nonsuitable for wilderness:
Thirtymile WSA: 1,852 acres
Lower John Day WSA: 6,820 acres

Total: 8,672 acres

Impacts on Wilderness Values

This alternative would add 5,686 acres in the Thirtymile WSA and 12,767 acres in the Lower John Day WSA to the NWPS. A total of 3 miles of ways (0.6 mile in the Thirtymile WSA and 2.4 miles in the Lower John Day WSA) would be closed to vehicle use. Approximately 37.5 miles of the John Day River would be closed to motorized watercraft. Wilderness values within these areas would be protected by legislative mandate.

Wilderness values, naturalness, solitude and primitive, and unconfined recreation would be preserved in the John Day River canyon and tributary canyons seen from the river. Naturalness would be enhanced by prohibiting motorized vehicle use on 0.6 mile and 2.4 miles of way in the Thirtymile and Lower John Day WSAs, respectively. These ways influence 980 acres (approximately five percent of the WSA) and closure would allow these ways to revegetate. The 1,852 acres within the Thirtymile WSA and 6,820 acres within the Lower John Day WSA which is recommended as nonsuitable for wilderness, would not receive special legislative protection. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be vulnerable to the effects of other resource management actions, including energy and mineral exploration and development and continued vehicle use.

Naturalness

Surface disturbing mineral and energy exploration activities on 120 acres of split-estate lands and 320 acres of private inholdings would adversely affect naturalness in the Lower John Day WSA. Prescribed burning of 500 acres in the Thirtymile WSA and 2,000 acres in the Lower John Day WSA would be noticeable in the short term. In the long term, naturalness would be increased through the restoration of a fire-dependent ecosystem.

The riparian fence along portions of the John Day River and tributary side canyons would likely be allowed because it would enhance riparian and wildlife habitat. The 2 miles of fence in the Thirtymile and 7.35 miles of fence in the Lower John Day WSAs would be an unnatural feature and would have a slight visual impact on approximately 773 acres within the immediate area.

In the area recommended nonsuitable for wilderness, projected energy exploration and development activities would disturb natural values. Development of three oil and gas wells, 1.5 miles of pipeline and 1.5 miles of access road would directly influence 10.5 acres and visually influence 400 acres. Vehicle use on 1.9 miles of ways in the Thirtymile WSA and 4.9 miles of ways in the Lower John Day WSA would continue to impact naturalness on approximately 2,200 acres (approximately eight percent of both WSAs). The 1.5 miles of riparian fence in this area would have a slight visual effect on the naturalness of 100 acres.

Solitude

Opportunities for solitude provided by the John Day River Canyon and associated side canyons would remain in the 18,453 acres recommended suitable for wilderness. Opportunities for solitude would be enhanced by eliminating motorized vehicle use on 3 miles of ways and by eliminating motorized watercraft on the river. This would provide an area where visitors could hike into and experience solitude without disturbance from motorized vehicles.

In the area recommended nonsuitable for wilderness, continued vehicle use on 6.8 miles of ways and human activities related to projected energy exploration and development would impair opportunities for solitude within and adjacent to areas where these activities occurred.

Primitive and Unconfined Recreation

Within the 18,453-acre area recommended suitable for wilderness, closure of 3 miles of ways to motorized vehicle use would increase primitive and unconfined recreation opportunities such as backpacking, hiking and camping. Eliminating vehicle use and rehabilitating vehicle ways in this area would increase the quality of photography, nature study and sightseeing.

Construction of 9.35 miles of riparian fence along portions of the John Day River and its tributary side canyons would enhance hunting and fishing opportunities.

Vehicle use would continue on 6.8 miles of ways within the 8,672-acre area recommended nonsuitable for wilderness within both WSAs and would continue to intrude upon primitive, non-motorized recreation opportunities in these areas. Projected energy development would impair opportunities for primitive recreation adjacent to where the activity occurred. Hunting and fishing opportunities would increase as a result of 1.15 miles of riparian fence in the Lower John Day WSA.

Special Features

Special features within the area recommended suitable for wilderness would be protected through closure of 3 miles of ways to vehicle use. Vehicle use on 1.6 miles of interior dead-end road would continue to impact scenic quality and cultural resources in the area.

Special features within the area recommended nonsuitable for wilderness, including scenic quality and cultural resources would continue to be impacted by vehicle use on 6.8 miles of ways. Scenic quality would be impacted by projected energy development. No impact to Federal candidate plant species are expected to occur since none are known to exist in this 8,672-acre area.

Conclusion: Wilderness designation of 18,453 acres within the Thirtymile and Lower John Day WSAs would protect and enhance existing wilderness values. In the 8,672-acre nonsuitable portion, projected activities would directly and indirectly impair wilderness values on approximately 2,200 acres with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 18,333 acres within the WSAs to energy and mineral entry. The remaining 8,792 acres, including 120 acres of split-estate, would be open for energy and mineral entry.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 18,333 acres by wilderness designation. Three projected production wells would be drilled in the area recommended nonsuitable.

Conclusion: Three oil and gas wells would be projected to be developed.

Mineral Development

Surface disturbing exploration for metallic minerals would be precluded on 2,770 of the 3,240 acres. Due to the speculative nature of these deposits no development is projected.

Conclusion: No impacts to metallic mineral development is expected.

Impacts on Vegetation

In the area recommended suitable for wilderness, 2,500 acres treated by prescribed burning (500 acres in Thirtymile WSA and 2,000 acres in the Lower John Day WSA) would change from mid-seral status to late seral status, or remain in late seral status through the reintroduction of fire into the ecosystem. Exclusion of livestock from riparian areas would allow these areas to change from early seral to late seral status in the long term, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. This would occur on 5.75 miles of the John Day River, 0.4 mile of Jackknife Canyon and 0.25 mile of Little Ferry Canyon. Residual ground cover would increase in both the burned and excluded areas. The 3 miles of ways would begin to revegetate in two to three years. The remainder of the WSAs (approximately 16,000 acres) would not change.

Upland vegetation on the 8,672 acres recommended nonsuitable for wilderness would generally not change. Riparian vegetation on 1.25 miles of John Day River, 0.6 mile of Jackknife Canyon and 0.95 mile of Little Ferry Canyon would change from early seral status to late seral status in the long term, with a corresponding increase in residual ground cover. Vegetation would be disturbed on 10.5 acres from projected energy development.

Conclusion: For the area recommended suitable for wilderness, seral status of 2,500 acres would change to or be maintained in late seral status through prescribed burning. Riparian vegetation on 6.4 miles of stream would change toward late seral status in the long term. Three miles of ways would revegetate. For the area recommended nonsuitable for wilderness, riparian vegetation on 2.8 miles of stream would change from early seral status to late seral status in the long term and vegetation would be disturbed on 10.5 acres from projected energy development.

Impacts on Wildlife

In the area recommended suitable for wilderness, wildlife habitat and forage for 340 mule deer and other wildlife species would be maintained. Disturbances to wildlife would be reduced through closure of 3 miles of ways to motorized vehicles. Riparian habitat conditions for wildlife and fish on 6.4 miles of stream would improve through construction of 7 miles of riparian fence and the subsequent exclusion of livestock. Minor negative impacts on deer movement would be incurred as a result of this fencing. Habitat diversity would be maintained through 2,500 acres of prescribed burning.

In the area recommended nonsuitable for wilderness, wildlife habitat and forage for 90 mule deer and other wildlife species would be maintained. Riparian habitat conditions for wildlife and fish on 2.8 miles of stream would improve through construction of 4.5 miles of riparian fence and subsequent livestock exclusion. Minor disturbance to wildlife would occur in the immediate vicinity of projected energy development.

Conclusion: Wildlife habitats and populations would be maintained on 18,453 acres designated wilderness. Riparian habitat along 9.2 miles of John Day River and tributaries would be improved.

Impacts on Watershed

In the area recommended suitable for wilderness, streambank stabilization and sedimentation would improve through exclusion of livestock use on 5.75 miles of the John Day River, 0.4 mile of Jackknife Canyon and 0.25 mile of Little Ferry Canyon. In Jackknife and Little Ferry canyons the increase in riparian vegetation would also improve water quantity and quality and lower the water temperatures. Fecal coliform bacteria from livestock would be reduced. There would be little change in watershed conditions over the rest of the area.

Upland watershed conditions would not change on the 8,672 acres recommended nonsuitable for wilderness. Streambank stabilization, water quantity and quality, and water temperature would improve on 0.6 miles of Jackknife Canyon and on 0.95 mile of Little Ferry Canyon excluded from livestock. Sedimentation and fecal coliform bacteria would also be reduced on the same area. Streambank stabilization and sedimentation would also improve on 1.25 miles of the John Day River through livestock exclusion.

Conclusion: Water-related conditions along 9.2 miles of the John Day River and in Little Ferry and Jackknife canyons would improve through livestock exclusion.

Impacts on Livestock Grazing

In the 18,453 acres recommended suitable for wilderness, livestock use would remain at the present level of 276 AUMs in the Thirtymile WSA and at approximately 502 AUMs in the Lower John Day WSA. Vehicle use for livestock management and facility inspection/maintenance on 3 miles of ways would be precluded, resulting in some inconvenience and expense to the livestock operators.

For the 8,672 acres recommended nonsuitable for wilderness, livestock use would remain at approximately 130 AUMs in the Thirtymile WSA and 302 AUMs in the Lower John Day WSA.

Conclusion: There would be no impact to levels of livestock grazing. Vehicle use of 3 miles of ways would be precluded, resulting in slight inconvenience and additional expense to the livestock operators.

Impacts on Recreation Use

For 18,453 acres recommended suitable for wilderness designation, the closure of three miles of ways would reduce recreation use by the hunters and anglers who had obtained special permission to use these privately-controlled ways to access public land. Motorized boat use would also be precluded which would further reduce recreation use levels. This would amount to an estimated 200 visitor use days per year. There would be a slight increase in the number of people seeking wilderness values of the area. Nonmotorized boating would increase at a rate of 5 to 10 percent per year as the area becomes with known for its float trips and fishing.

For 8,672 acres recommended nonsuitable for wilderness designation, 6.8 miles of ways and 1.6 mile of dead-end interior road would remain open for vehicle use controlled by the private landowners. A low level of recreation use by the public would continue to occur in this area.

Conclusion: The area's recreation use level of 15,000 visitor days per year, would decrease by 200 visitor days per year in the short term. In the long term, visitor use levels would not be affected and use levels would continue to increase at a rate of five to ten percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 1,210 AUMs. Projected energy development would amount to three oil and gas production wells. Overall recreation use would remain at 15,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level, plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $195,000.

No Wilderness/No Action

Recommended suitable for wilderness:
Thirtymile WSA: 0 acres
Lower John Day WSA: 0 acres

Total: 0 acres

Recommended nonsuitable for wilderness
Thirtymile WSA: 7,538 acres
Lower John Day WSA: 19,587 acres

Total: 27,125 acres

Impacts on Wilderness Values

Under this alternative, none of the 27,125 acres in the WSAs would be designated wilderness, and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation and the area's special features would be subject to the effects of projected management actions. Projected actions include surface disturbing energy and mineral exploration and development on 10.5 acres, prescribed burning of 11,300 acres, seven spring developments, construction of 10.5 miles of riparian fence and construction of 7.75 miles of livestock management fence in other locations. Vehicle use, limited to existing roads and ways would continue.

Naturalness

Vehicle use on the 9.8 miles of ways and 1.6 miles of dead-end road would continue the impact of the vehicles upon naturalness on approximately 4,570 acres (17 percent of the combined acreage of both WSAs). Most of this surface disturbance of the area's naturalness would occur on the plateaus on both sides of the John Day River.

Energy exploration and development would cause short and long-term impacts to naturalness in areas not within sight of the river. (Existing "no-surface occupancy" stipulations would prevent surface disturbance from oil and gas development within sight of the river except on the 120 acres of split-estate land). Projected development of three oil and gas wells would directly influence 10.5 acres and visually influence 400 acres. Mineral activities would have similar effects anywhere in the WSA. Prescribed burning of 11,300 acres within both WSAs (9,800 acres to enhance wildlife habitat diversity and 1,500 acres to reduce sagebrush invasion and enhance grass vigor for livestock management) would be noticeable within the short term. In the long term, these treatments would eventually enhance naturalness through the restoration of a fire-dependent ecosystem.

The construction of 10.5 miles of riparian fence along portions of the John Day River would protect and enhance the naturalness of 9.2 miles of riparian area.

The fence would be an unnatural feature, visually influencing approximately 800 acres. In addition, 7.75 miles of livestock management fence in other portions of the WSAs would influence naturalness on approximately 670 acres.

The construction of seven spring developments would directly impact eight acres and visually influence 200 acres.

Solitude

Continued vehicle use on 9.8 miles of ways and 1.6 miles of road, and human activity associated with energy and mineral development outside the "no surface occupancy" area would cause repeated local impairment of opportunities for solitude adjacent to the activity. Vehicle use primarily occurs on the canyon plateaus, on the 1.6 miles of dead-end roads leading down from the canyon rim to private land along the John Day River and on the 2.6 miles of dead-end roads between the WSAs. Motorized watercraft use would continue to occasionally reduce solitude along the river corridor. Opportunities for solitude in the large unroaded core area and rugged meandering canyons would remain. Prescribed burning of 11,300 acres would not significantly affect solitude since the burning would be conducted over the long term and would be concentrated in sagebrush and sagebrush/grass vegetation.

Primitive and Unconfined Recreation

The projected activities described in the previous sections would reduce primitive, non-motorized recreation opportunities in areas within and adjacent to these activities. Vehicle use would continue to be limited to existing roads and ways and would continue to intrude upon primitive, non-motorized recreation opportunities in the vicinity of these roads and ways in the WSA. Construction of the riparian fences would improve opportunities for primitive and unconfined recreation such as fishing, hunting, photography and camping in a natural setting. Energy and mineral exploration and development would reduce primitive recreation opportunities through surface disturbance and required vehicle access.

Special Features

Vehicle use of existing roads and ways would maintain the impacts on special features including scenery and cultural values. Energy and mineral exploration and development would impair scenery in areas not seen from the John Day River. The riparian fence along portions of the John Day River would allow special management of the riparian areas, resulting in enhancement of wildlife and fisheries habitat.

Conclusion: In the absence of wilderness designation, projected management activities would directly and indirectly impair wilderness values on a long-term basis on approximately 4,900 acres (18 percent of combined acreage of the WSAs) with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire Thirtymile WSA (7,538 acres) and Lower John Day WSA (19,587 acres) would be open to energy and mineral entry.

Energy Development

Oil and gas exploration and development would be allowed on the 8,672 acres and on 120 acres of split-estate land that are not presently protected by restrictive lease stipulations. Based on favorable geologic conditions combined with evidence from nearby drilling, development of three oil and gas wells is projected.

Conclusion: Production from three oil and gas wells would be projected to occur.

Mineral Development

Mineral entry would be allowed within the WSAs on the 3,240 acres having moderate potential for the occurrence of metallic minerals. Based on the speculative nature of the metallic mineral potential only exploration for these minerals would continue.

Conclusion: There would be no impact on mineral development.

Impacts on Vegetation

For 9,800 acres treated by prescribed burning (2,800 acres in the Thirtymile WSA and 7,000 acres in the Lower John Day WSA) bunchgrass communities in upper mid-seral to lower late seral status would change to or be maintained in late seral status through the reintroduction of fire into the ecosystem. Another 1,500 acres would be changed from early seral or mid-seral status toward potential new community (PNC) through prescribed burning designed to remove the sagebrush overstory. Exclusion of livestock from riparian areas and improved management would allow these areas to change from early seral to late seral status in the long term, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. This would occur on 7 miles of the John Day River, 1 mile of Jackknife Canyon and 1.2 miles of Little Ferry Canyon.

Seral status would change from early seral to mid-seral on 2,000 acres in the canyon bottoms through improved livestock management. Forage utilization would be more evenly dispersed throughout the WSAs with utilization in canyon bottoms changing from 70 percent to 50 percent and a corresponding increase in residual ground cover.

The 9.8 miles of ways would not revegetate due to continued vehicle use. Projected oil and gas development and livestock spring development would disturb 18.5 acres.

Conclusion: Seral status of 9,800 acres would change to or be maintained in late seral status through prescribed burning. Seral status of 1,500 acres would change from early or late seral status toward PNC, also through prescribed burning. Seral status of 2,000 acres would change to mid-seral status through improved livestock management. Sera status of riparian vegetation along 9.2 miles of strear would change toward late seral status through livestock management or exclusion. Vegetation on 18.5 acres would be disturbed through projected management activities.

Impacts on Wildlife

Wildlife habitat diversity for approximately 430 mule deer and other wildlife in this WSA complex would be enhanced through prescribed burning. Prescribed burning would be accelerated, and 9,800 acres (7,000 acres Lower John Day, 2,800 acres Thirtymile) would be burned to increase habitat diversity with approximately 40 percent of the WSAs burned in a 50-year period. The minor disturbance from energy development activities and vehicle use would be restricted to the immediate vicinity of the activity. Riparian habitat for wildlife and fish would be improved on 9.2 miles of the John Day River and tributaries through improved livestock management/exclusion.

Conclusion: Habitat would be enhanced and habitat diversity would be increased on 9,800 acres. Mule deer populations would be maintained. Riparian habitat would be improved on 9.2 miles of stream. Minor disturbances would occur due to energy development activities and vehicle use.

Impacts on Watershed

Streambank stabilization and sedimentation would improve through exclusion or management of livestock on 9.2 miles of the John Day River and in Jackknife and Little Ferry canyons. In Jackknife and Little Ferry canyons the increase in riparian vegetation would also improve water quantity and quality and lower the water temperatures. Fecal coliform bacteria from livestock would be reduced.

There would be little change in watershed conditions over the rest of the WSAs.

Conclusion: Water quality and streambank stabilization would improve on 9.2 miles of John Day River and Little Ferry and Jackknife canyons.

Impacts on Livestock Grazing

Livestock use would remain at the present level of 406 AUMs in the Thirtymile WSA and 804 AUMs in the Lower John Day WSA. Management fences and 1,500 acres of prescribed burning and spring developments would improve livestock management and forage quality. Grazing systems would be initiated which would result in better livestock distribution and changes in season of use. Vehicle use for livestock management and facility inspection/maintenance would continue on 9.8 miles of ways.

Conclusion: There would be no impact to levels of livestock grazing. Livestock distribution and management would improve with the development of seven springs and 7.75 miles of management fence.

Impacts on Recreation Use

Motorized recreation use would continue on the John Day River with motorized watercraft and on the 9.8 miles of ways and 1.6 miles of dead-end interior road at the discretion of adjacent landowners. The recreation use level would increase at a rate of 5 to 10 percent for hunting and fishing. Surface disturbance from projected management activities would slightly disturb the natural setting and the scenic values observed as one floats the river or otherwise uses the area.

Conclusion: The area's recreation use level of 15,000 visitor days per year would not be affected and would continue to increase at an annual rate of 5 to 10 percent.

Impacts on Local Personal Income

Livestock grazing would remain at 1,210 AUMs. Projected energy development would amount to three oil and gas production wells. Overall recreation use would remain at 15,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level, plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $195,000.

Unavoidable Impacts of the Proposed Action

Under the Proposed Action, for the 28,556 acres recommended suitable for wilderness, surface disturbing exploration and development for energy and minerals would be foregone. Projected development of three oil and gas wells would be foregone. Vehicle use would be excluded, reducing opportunities for those who prefer this type of recreation, including use of motorized watercraft. There would be a slight increase in livestock management costs as a result of the closure of 15.8 miles of ways and 6.2 miles of roads.

For the 1,962 acres recommended nonsuitable for wilderness, wilderness values would not be protected.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, for the 28,556 acres recommended suitable for wilderness, most existing short-term uses would continue. There would be some additional, minor inconvenience and expense to livestock operators resulting from the exclusion of vehicles for day-to-day inspection activities, although this use is currently limited. The limited amount of vehicle-oriented recreation would decline. The long-term productivity of the wilderness values would be preserved.

For the 1,962 acres recommended nonsuitable for wilderness, existing short-term uses would continue. There would be no effect on long-term productivity; however, wilderness values would be reduced on approximately 400 acres with further declines from other potential uses over the long term.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action there would be no irreversible and irretrievable commitments of wilderness resources or any other resources in the 28,556 acres recommended as suitable for wilderness. The wilderness values on 1,962 acres recommended nonsuitable for wilderness would be reduced on 400 acres by oil, gas and mineral exploration with further declines from other potential uses over the long term.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

Both WSAs would be manageable as wilderness under the all wilderness, Proposed Action and partial wilderness alternatives. However, the areas could be more difficult to manage in the all wilderness alternative because the wilderness areas would include narrow extensions bounded by private lands, and there would be the possibility that private inholdings could be developed or used in ways that would not be compatible with wilderness management of the public lands.

Manageability of the 120-acre parcel of split estate could be affected if mineral development were to occur. The area recommended suitable under the proposed action would be more manageable as wilderness because the inholdings would be acquired. If the owners were willing to sell or exchange their lands, the narrow extensions of the WSAs would be recommended nonsuitable as wilderness. The addition of 2,433 acres of newly-acquired non-WSA public land within the John Day River canyon would improve manageability as wilderness by improving the configuration of the WSA and increasing the amount of John Day River within the area recommended for wilderness designation.

The two private inholdings and a 200-acre finger of private land in the Lower John Day WSA and two private parcels between the two WSAs are located on the river. These lands are presently used for livestock grazing, fishing or camping; however, this could change at the discretion of the landowner. There has been no indication that present use of the land would change in the foreseeable future.

Rationale for Selection of the Proposed Action

The Proposed Action is recommended because preserving the wilderness values on those lands would outweigh the benefits of allowing the lands to remain open for such activities as oil and gas exploration and development or mining for metallic minerals. Combining the Thirtymile WSA with the Lower John Day WSA and adding 2,433 acres of newly-acquired non-WSA public land would preserve wilderness values which are unique in the region.

Special wilderness features which would be preserved include a high density of prehistoric and historic sites, anadromous fish populations and pristine vegetative communities. The area designated wilderness would include the John Day River, most side canyons, cultural resource sites and nearly all areas that contain outstanding wilderness values.

The rare opportunity to float or hike 45.5 miles through a major river canyon up to 1,600 feet deep in a nearly natural condition would be preserved. This canyon area is characterized by steep, reddish-brown rocky bluffs and numerous side canyons that offer outstanding opportunities for solitude and a wide range of primitive and unconfined types of recreation.

A total of 1,962 acres in the two WSAs would be recommended as nonsuitable for wilderness in the proposed action due to intervening private land and limited wilderness values. The benefits of preserving the limited wilderness values on those lands would be outweighed by the benefits of retaining options for development of energy and other resources.

6. Summary and Analysis of Public Comments

The following is a summary of public comments and responses to those comments specific to this WSA. They deal with the adequacy of the analysis in this appendix. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: ACMPs are not nominated by the public, but by the mineral industry. **Response:** Nominations for Areas of Critical Mineral Potential were solicited from everyone, including the mineral industry. The mineral industry is one of the many publics involved and interested in the management of the public lands.

Comment: Where are exploratory wells and has there been any commercial development? **Response:** Chapter 3 - Energy Resources has been expanded to give more information on the location and development of these wells.

Comment: Are mining claims valid in the WSAs? **Response:** There are no mining claims in either the Thirtymile or Lower John Day WSA.

Comment: The National Park Service Wild and Scenic River Study mentions some water quality problems on the John Day River and these should have been addressed better in the alternative. **Response:** The wild and scenic study (September 1979) states there are problems with nonpoint sources, forest practices in the upper tributaries and farming practices. A study is being made and solutions will be presented in a Basin 208 plan. In addition, water quality projects such as impoundments, bank stabilization projects and check dams would not generally be allowed in a designated wilderness since they would alter the naturalness of the area.

Comment: *Lupinus sericeus* var. *egglestonianus* (silky lupine) has previously been found in these WSAs but was not addressed. **Response:** Data on file at the Oregon Natural Heritage Data Base do not indicate that this species has ever been found in either of the WSAs. The historic sightings of this Lupinus were on sandy soils in the Moro, Biggs and Olex areas. The Lower John Day WSA could be suspected of harboring this species based on geographical proximity, but based on ecological information, this plant would not be expected.

Comment: Wilderness designation will impede outdoor recreation relating to river travel and threatened water quality of the John Day River. **Response:** Analysis in Chapter 4 - Impacts on Watershed and Recreation indicate that only motorized boat use would be impeded by wilderness designation. Nonmotorized recreation uses and water quality and quantity would be either maintained or enhanced.

Table 1. Summary of Proposed Management Under Each Alternative, Thirtymile (OR-5-1) and Lower John Day (OR-5-6) WSAs

Proposed Management	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	27,125	27,596	18,453	0
Acres Closed to ORVs by Wilderness Designation	27,125	27,596	18,453	0
Miles of Roads Closed[1]	0	6.2	0	0
Miles of Ways Closed	9.8	15.8	3.0	0
Acres of Full Fee Estate acquired[2]	0	840	0	0
Acres of Mineral Estate acquired[3]	0	120	0	0
Energy/Mineral Actions				
Acres withdrawn from Mineral Location and Leasing by Wilderness Designation[4]	27,005	27,476	18,333	0[4]
Roads Constructed (Miles)	0	0	1.5	1.5
Oil and Gas Pipelines (Miles)	0	0	1.5	1.5
Drill Sites (Number)	0	0	3	3
Non-structural Wildlife Projects Developed				
Brush Control w/o seeding (acres) (Prescribed Burning)	3,200	2,500	2,500	9,800
Structural Livestock Projects Developed				
Fence (riparian-miles)	10.5	12.8	10.5	10.5
Fence (management-miles)	0	0	0	7.75
Springs (number)	0	0	0	7
Non-structural livestock Projects Developed Brush Control w/o seeding (acres) (Prescribed burning)	0	0	0	1,500

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[1] Except for 3.6 miles of dead-end interior road, 2.6 miles of road between the WSAs and 15.8 miles of ways in the WSAs, most of the acreage shown is already closed to cross-country vehicle use through an existing "limited" ORV designation.

[2] Upon acquisition from willing landowners, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

3Upon acquisition of the mineral estate, these lands would be withdrawn from energy/mineral location and leasing.

[4] Although not closed by wilderness designation, 18,333 acres are already closed to surface disturbing energy exploration and development through existing "no surface occupancy" lease stipulations.

Table 2. Summary of Environmental Consequences of Alternatives, Thirtymile (OR-5-1) and Lower John Day (OR-5-6) WSAs

Resource or Activity	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/No Action
Wilderness Values	Wilderness designation of 7,538 acres of the Thirtymile WSA and 19,587 acres of the Lower John Day WSA would protect and enhance existing wilderness values.	Wilderness designation of 7,332 acres in the Thirtymile WSA and 20,264 acres in the Lower John Day WSA, along with acquisition of 120 acres of mineral estate, 840 acres of private land and closure of 6.2 miles of boundary and interior roads would protect and enhance wilderness values on 28,556 acres. Wilderness values on the 1,962 acres recommended nonsuitable would be vulnerable to oil, gas and mineral exploration.	Wilderness designation of 5,686 acres in the Thirtymile WSA and 12,767 acres in the Lower John Day WSA would protect and enhance existing wilderness values. Wilderness values on 8,672 acres recommended nonsuitable would be reduced on approximately 2,200 acres with further declines from other potential uses over the long term.	Projected management actions would impair the area's naturalness, solitude and primitive and unconfined recreation opportunities on approximately 4,900 acres with further declines from other potential uses over the long term.
Energy and Mineral Development	Projected production from 3 oil and gas wells would be foregone.	Projected production from 3 oil and gas wells would be foregone.	Projected production from 3 oil and gas wells would occur.	Projected production from 3 oil and gas wells would occur.
Vegetation	2,500 acres burned would change to or be maintained in late seral status in the long term. Riparian vegetation along 9.2 miles of stream would change toward late seral status. 9.8 miles of ways would revegetate.	2,700 acres burned would change to or be maintained in late seral status in the long term. Riparian vegetation along 11.0 miles of stream would change toward late seral status. 15.8 miles of ways and 6.2 miles of road would revegetate.	2,500 acres burned would change to or be maintained in late seral status in the long term. Riparian vegetation along 9.2 miles of stream would change toward late seral status. 3 miles of ways would revegetate. 10.5 acres would be disturbed through projected energy development.	11,300 acres burned would change to or be maintained in late seral status or change toward PNC in the long term. 2,000 acres would change to mid-seral status through improved livestock mgmt. Riparian vegetation along 9.2 miles of stream would change toward late seral status through management/exclusion of livestock. 18.5 acres would be disturbed by projected management activities.
Wildlife	Habitat and populations maintained. Riparian habitat improved along 9.2 miles of stream.	Habitat and populations maintained. Riparian habitat improved along 11.0 miles of stream.	Habitat and populations maintained. Riparian habitat improved along 9.2 miles of stream.	Habitat diversity would increase on 9,800 acres and populations would be maintained. Riparian habitat improved along 9.2 miles of stream. Minor disturbance from projected management activities.
Watershed	Improvement of water-related conditions along 9.2 miles of the John Day River and Little Ferry and Jackknife canyons would occur.	Improvement of water-related conditions along 11 miles of the John Day River and Little Ferry and Jackknife canyons would occur.	Improvement of water-related conditions along 9.2 miles of the John Day River and Little Ferry and Jackknife canyons would occur.	Improvement of water-related conditions along 9.2 miles of the John Day River and Little Ferry and Jackknife canyons would occur.
Livestock Grazing	No impact to levels of livestock grazing. Vehicle use precluded on 9.8 miles of ways.	No impact to levels of livestock grazing. Vehicle use precluded on 15.8 miles of ways and 6,2 miles of road.	No impact to levels of livestock grazing. Vehicle use precluded on 3 miles of ways.	No impact to levels of livestock grazing. Development of 7 springs and 7.75 miles of management fence would improve livestock distribution and management.
Recreation Use	A short term decrease of 200 visitor days per year. No impact to use in the long term.	A short term decrease of 300 visitor days per year. No impact to use in the long term.	A short term decrease of 200 visitor days per year. No impact to use in the long term.	No change in recreation use use levels or types of activities.
Local Personal Income	Annual local personal income would remain at approximately $195,000.	Annual local personal income would remain at approximately $195,000.	Annual local personal income would remain at approximately $195,000.	Annual local personal income would remain at approximately $195,000.

Table 3. Classification of Energy and Mineral Potential, Thirtymile (OR-5-1) and Lower John Day (OR-5-6) WSAs

Commodity	Area	Level of Potential	Level of Certainty
Metals	All of Lower John Day	L	C
Metals (zinc, mercury, lithium, gold)	Part of Thirtymile (See Map 5)	M	C
Metals	Rest of Thirtymile	L	C
Diatomite	All of both WSAs	O	B
Limestone	All of both WSAs	O	B
Zeolites	All of both WSAs	O	B
Bentonit		L	B
Uranium/Thorium	All of Lower John Day	O	A
Geothermal	All of both WSAs	O	C
Oil/Gas	All of both WSAs	M	C
Sodium/Potassium	All of both WSAs	O	B
Coal	All of both WSAs	O	B
Tar Sands/C			

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low Potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

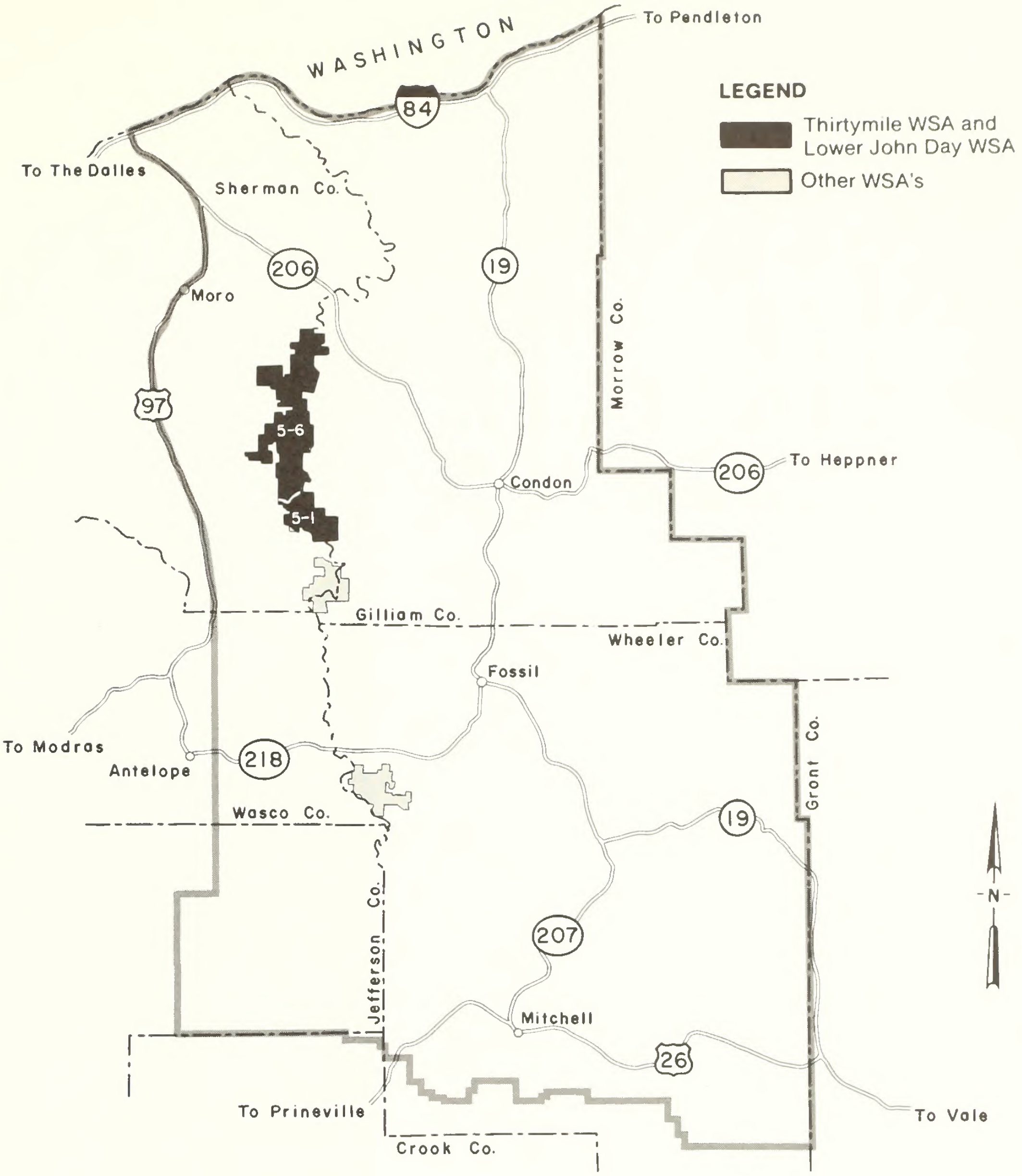
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

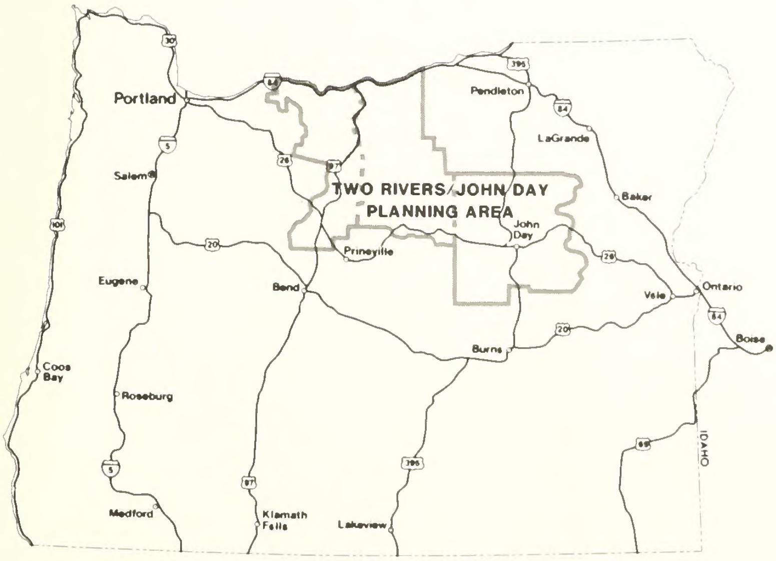
Table 4. Existing Livestock Use, Thirtymile (OR-5-1) and Lower John Day (OR-5-6) WSAs

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Current Percent of Allotment in WSA	Current Estimated Use in WSA (AUMs)
		Thirtymile WSA		
Decker (No. 2538)	206	1/16-10/14	79	162
Horseshoe Bend (No. 2521)	43	7/01-09/01	58	25
Sid Seale (No. 2619)	708	3/01-02/28	28	183
Tatum (No. 2629)	133	5/16-10/19	32	36
Total Thirtymile	1,090			406
		Lower John Day WSA		
Murtha (No. 2597)	227	03/01-01/24	16	36
Higley (No. 2553)	20	04/01-08/31	95	19
Miller (No. 2591)	46	05/01-10/31	100	46
Seale (No. 2619)	708	03/01-02/28	55	391
Belshe (No. 2509)	62	04/01-06/14	100	62
Dipping Vat (No. 2631)	25	04/01-10/07	84	21
Laffon & Carlson (No. 2572)	85	06/01-10/31	95	81
Eakin (No. 2541)	12	04/01-06/30	100	12
James Brown (No. 2522)	65	05/01-10/31	100	65
Martin (No. 2581)	22	05/01-10/15	64	14
Horseshoe Bend (No. 2521)	43	07/01-09/01	42	18
Decker (No. 2538)	206	04/16-10/14	18	38
Bull Canyon (No. 2651)	3	05/20-8/19	42	1
Total Lower John Day	1,524			804
Total both WSAs	2,614			1,210

Table 5. Effects of Alternatives on Local Personal Income, Thirtymile and Lower John Day WSAs (OR-5-1 and 6) (1981 price levels)

Item	Unit of Measure	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Livestock Grazing	AUMs	No change	No change	No change	No change
Energy & Mineral Development:					
Oil & Gas Production Wells	Number	No change	No change	+3	+3
Recreation Use	RVD	No change	No change	No change	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES					
Livestock Grazing	$	No change	No change	No change	No change
Energy & Mineral Development:					
Oil & Gas Production Wells	$	No change	No change	Unknown	Unknown
Recreation Use	$	No change	No change	No change	No change
Total	$	No change	No change	No change	No change



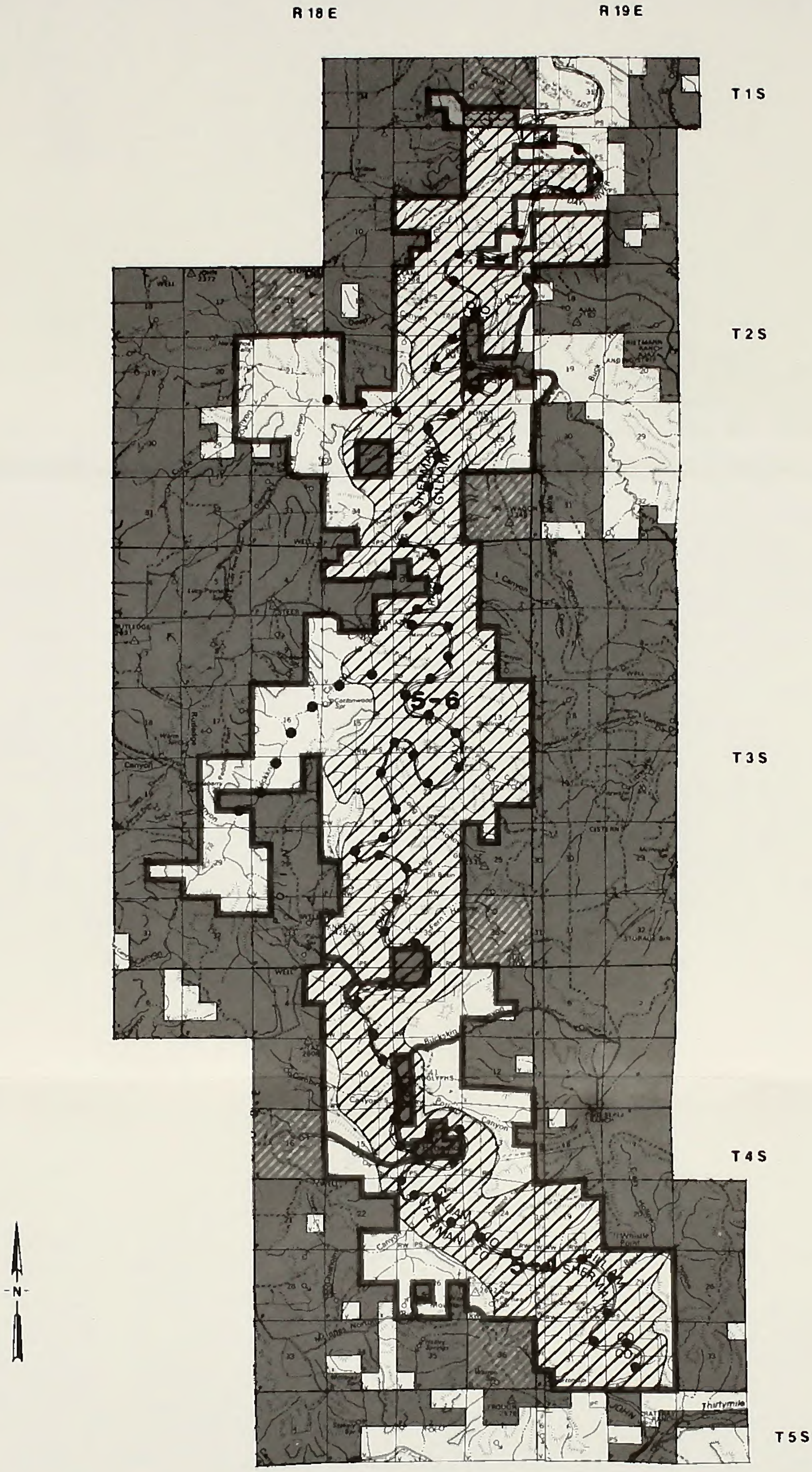


U. S. Department of the Interior
Bureau of Land Management

Prineville District
Thirtymile WSA
OR-5-1 and
Lower John Day WSA
OR-5-6

LOCATION MAP

MAP 1



U. S. Department of the Interior
Bureau of Land Management
Prineville District

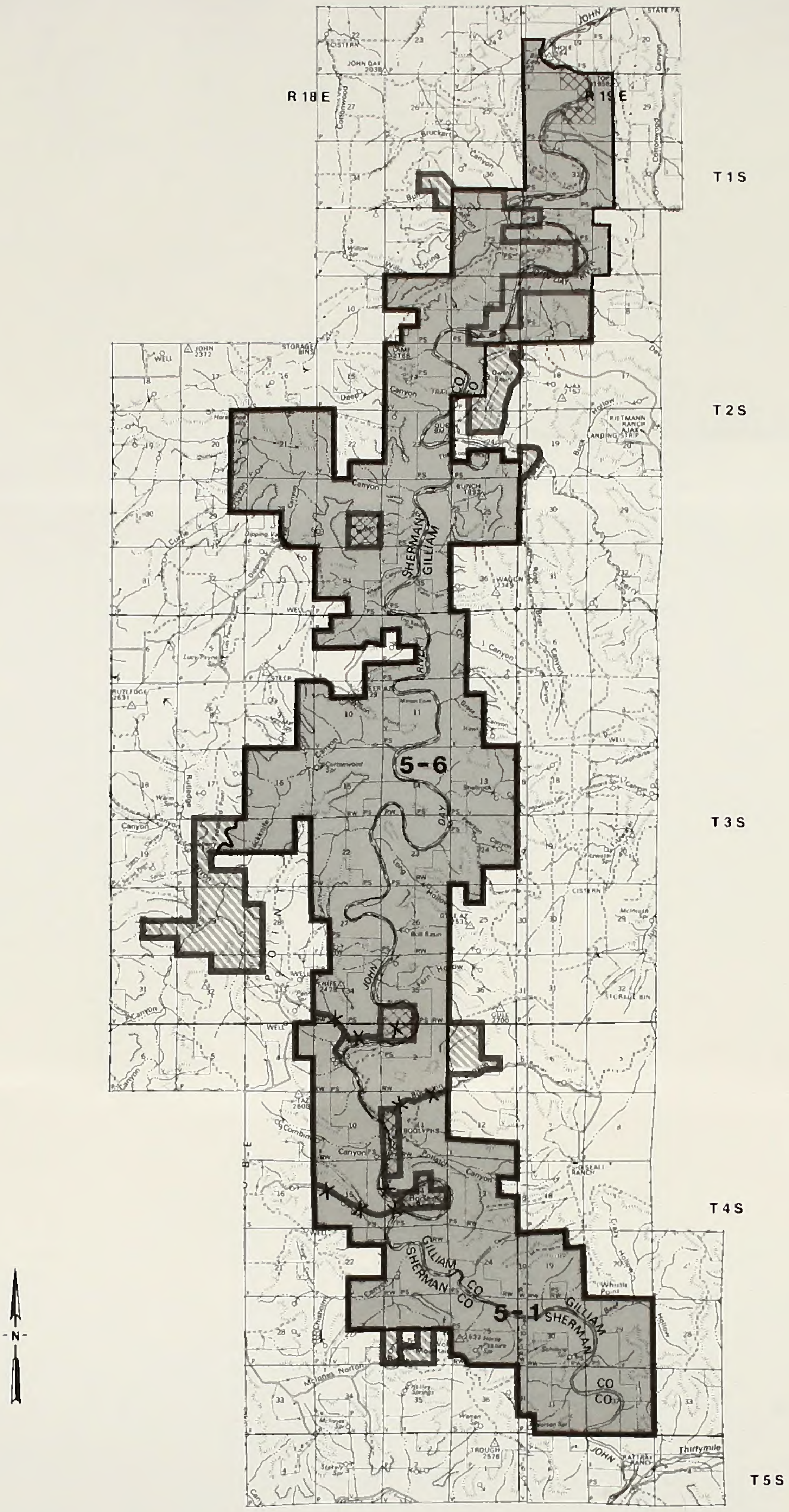
Thirtymile WSA
OR-5-1 and
Lower John Day WSA
OR-5-6

LAND OWNERSHIP

MAP 2

LEGEND

▩	BLM Land Studied Under Section 202 of FLPMA (Other BLM Land in WSA Studied Under Section 603 of FLPMA)
━	Wilderness Study Area Boundary
☐	Bureau of Land Management
▨	State
■	Private
▤	BLM Surface–State or Private Subsurface (Split Estate)
▨	Outstanding Scenic Values
● ● ●	Anadromous Fish Habitat



U. S. Department of the Interior
Bureau of Land Management
Prineville District

Thirtymile WSA
OR-5-1 and
Lower John Day WSA
OR-5-6

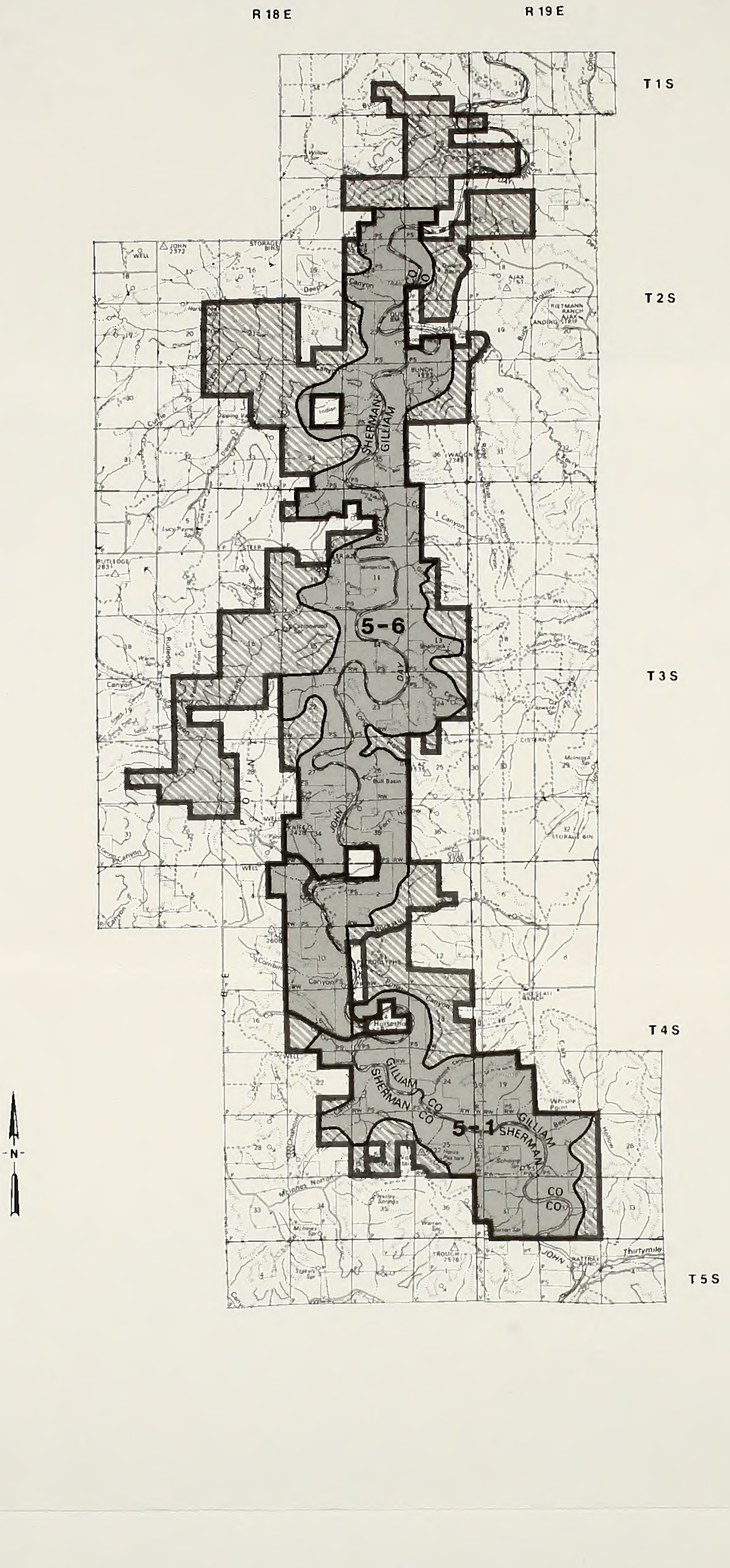
PROPOSED ACTION

1 0 1 2 MILES

MAP 3

LEGEND

- ▬ Wilderness Study Area Boundary
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- X—X Recommended Road Closure



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Thirtymile WSA
OR-5-1 and
Lower John Day WSA
OR-5-6

PARTIAL ALTERNATIVE

1 0 1 2 MILES

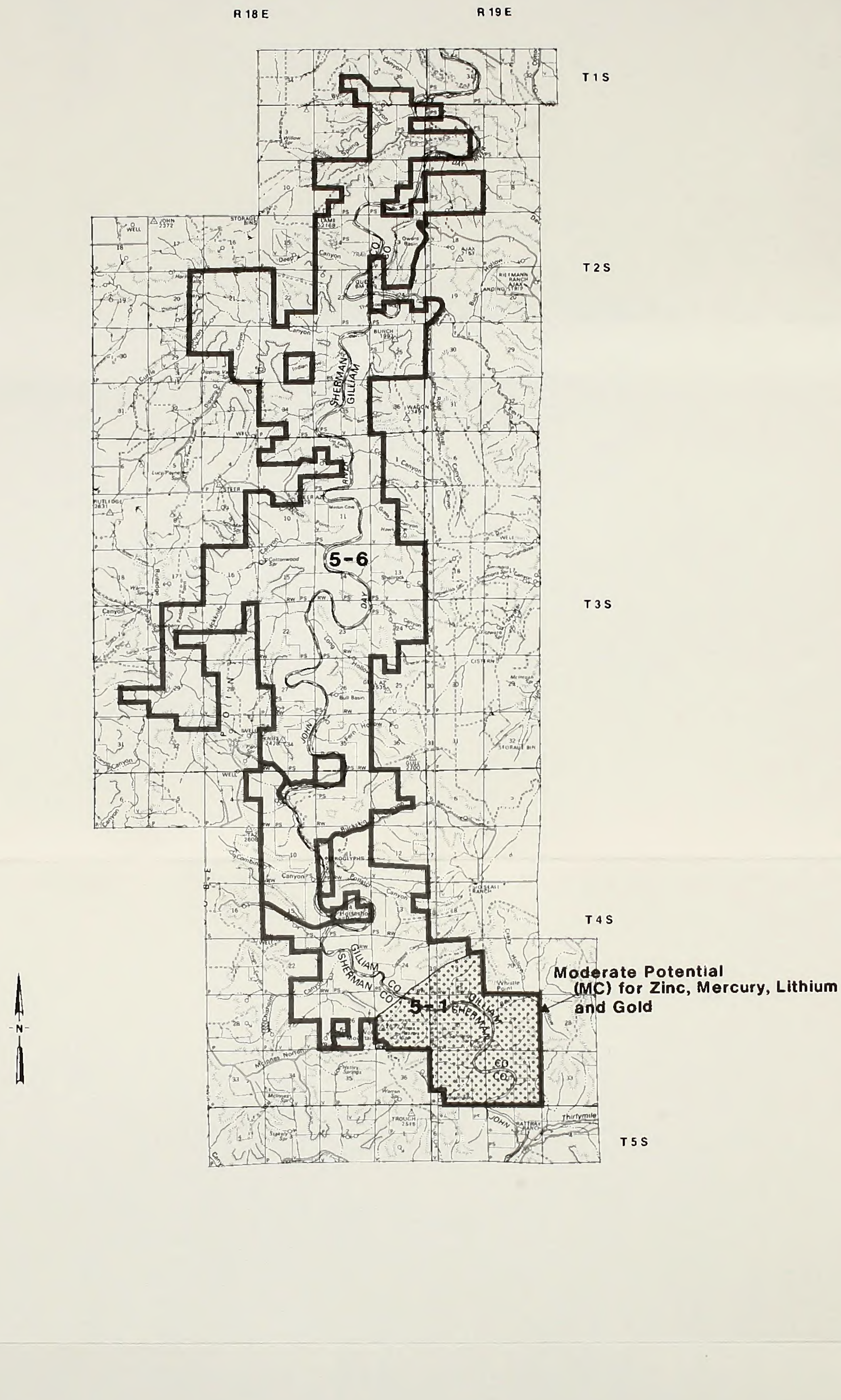
LEGEND

— Wilderness Study Area Boundary

■ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

MAP 4



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Thirtymile WSA
OR-5-1 and
Lower John Day WSA
OR-5-6

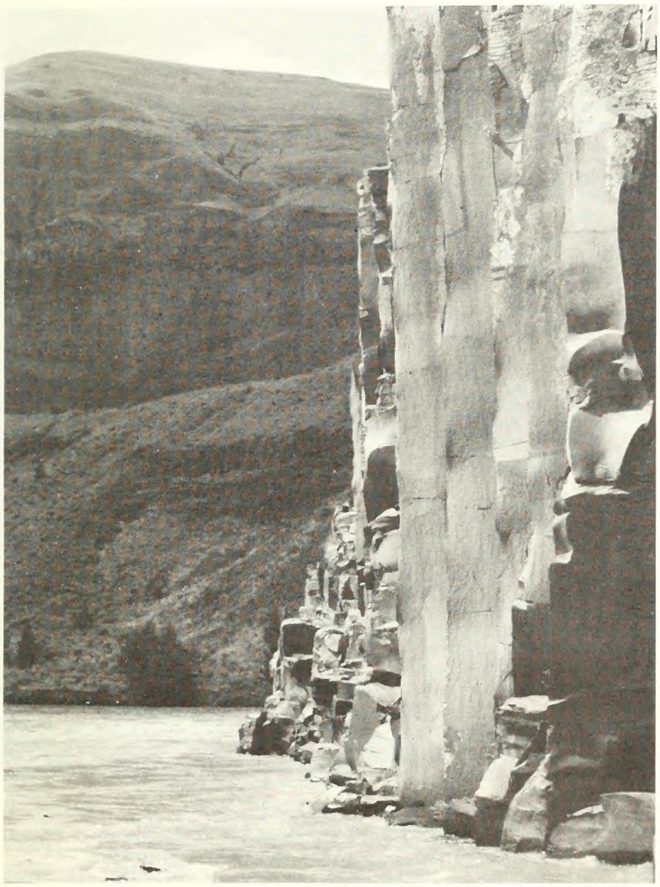
MODERATE OR HIGH POTENTIAL
MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

Entire WSA:
Moderete Potential
(MC) for Oil and Gas

MAP 5

Thirtymile WSA, OR-5-1. John Day River, looking west in the southern portion of the WSA. Within area recommended suitable under the proposed action and partial alternatives. Illustrates the steep, rugged John Day River Canyon. October 1978.



Thirtymile WSA, OR-5-1. John Day River, looking west in the central portion of the WSA. Within area recommended suitable under the proposed action and partial alternatives. Illustrates massive basalt columns near Cordwood Canyon. October 1978.

Lower John Day WSA, OR-5-6. Looking north into the north-central portion of the WSA. Within area recommended suitable under the proposed action and partial alternatives. Example of basalt pinnacles in the John Day River Canyon. October 1978.

Lower John Day WSA, OR-5-6. Looking northeast downstream from Jackknife Canyon. Within area recommended suitable under the proposed action and partial alternatives (the tablelands out of sight from the river are nonsuitable under the partial alternative). Shows the John Day River Canyon and the flatter tablelands above the river. January 1980.

Appendix to the Wilderness Environmental Impact Statement for Oregon

North Pole Ridge Wilderness Study Area (OR-5-8)

1. Introduction

General Description of Study Area

North Pole Ridge Wilderness Study Area (WSA) is located along approximately 6 river miles of the John Day River, about 15 miles northwest of Fossil, Oregon, and 65 miles northeast of Madras, Oregon (see Map 1). It is about 120 miles southeast of Portland, Oregon. U.S. Highway 97 is ten miles west of the area. Within the WSA, the John Day River forms the boundary between Sherman and Gilliam Counties.

Except for projections on the north and south, North Pole Ridge WSA is basically rectangular, extending 3 miles north to south and 4 miles east to west (see Map 2).

There are 6,369 acres of public land within the North Pole Ridge WSA, including 120 acres of split-estate land. Private inholdings consist of four tracts totaling 240 acres.

The western, southern and eastern boundaries of the study area are formed by the borders between private, State and public lands. The northern boundary is formed by the border between public and private lands and a utility gas pipeline and maintenance road.

Private land surrounding the WSA prevents legal public access by road. Public access to the WSA is possible only by floating the John Day River. The main put-in point is located at Clarno where State Highway 218 crosses the John Day River and the main take-out point is at Cottonwood Bridge where State Highway 206 crosses the John Day River.

The main feature of the WSA is the 800 to 1,600-foot-deep John Day River Canyon. Columbia River basalt cliffs and escarpments are interspersed with talus slopes and steep, bunchgrass-covered slopes. Fourteen side canyons enter the John Day River within the WSA.

The John Day River is a north-flowing tributary of the Columbia River. It has an average flow fluctuating from 10,000 cubic feet per second in early spring to less than 100 cubic feet per second in late summer, due to natural seasonal variation and irrigation use during the growing season.

Water quality of the John Day River meets State quality standards. Several springs make up the only other water source within the WSA.

Vegetation in the WSA is a big sagebrush/bunchgrass community. Juniper trees are scattered throughout the area. Side canyons with springs have small riparian zones.

Interrelationships

A strip of public land about 1.5 miles wide, encompassing 1,750 acres, separates Thirtymile WSA from North Pole Ridge WSA. Included in this land is a utility corridor for a 36-inch buried gas pipeline and maintenance road. A permit has also been issued for construction of another 42-inch gas pipeline through this same corridor in the near future.

A 147-mile stretch of the John Day River, including the segment passing through the WSA, has been designated as a recreational component of the National Wild and Scenic Rivers System. This same river segment is also an Oregon State Scenic Waterway which provides some State control over private land use changes within 0.25 mile of the river.

A portion of the WSA adjacent to the John Day River is also part of a power site reserve which identifies the land for potential waterpower and water storage development. This "withdrawal" is scheduled for review in the next few years, which may lead to its revocation. Power site or water storage development is not foreseen, and therefore not discussed further. (See the Interrelationships section of the Statewide EIS volume.)

The entire WSA falls within lands ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. This treaty reserved to the Indians rights for hunting, fishing and gathering in usual and accustomed places and grazing stock on unclaimed lands.

The WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) Biggs Wildlife Unit. The WSA supports approximately 100 mule deer during the spring to fall months. The majority of winter use occurs out of the WSA. The present mule deer population in this unit is at its management objective level. The management objective for nongame wildlife is to maintain populations of naturally occurring species at self-sustaining levels. One introduced game species, the chukar partridge, is to be maintained at self-sustaining levels also. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife.

Sherman and Gilliam Counties have not identified any conflicts between the proposed action and the counties' comprehensive plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review processes. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on the area's wilderness values, including outstanding opportunities for solitude and primitive recreation, and special features including the John Day River, botanic values, fisheries habitat, archaeological values and outstanding scenery;
- impact on energy and mineral development;
- impact on recreation use levels;
- impact on migrating bird populations;
- impact on grazing use levels and management; and
- impact on private inholdings and possible resulting problems from trespass, litter and vandalism, and methods of controlling it. (Effects of wilderness designation on private lands are addressed in the Statewide EIS volume.)

Also raised as an issue was the possibility of placing a major burden on local and county governments from additional responsibilities (such as, intensive fire management and control programs and visitor assistance programs like search and rescue) which might arise if North Pole Ridge WSA is designated wilderness. (This issue is not addressed because substantial visitor use increases are not expected to result from designation.)

No other issues specific to this WSA were identified by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State, and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness
- proposed action
- partial wilderness
- no wilderness/no action

An enhanced alternative was not analyzed because no feasible alternative exists to significantly enhance wilderness values beyond the all wilderness or proposed action.

Another alternative considered but not analyzed was the possibility of recommending the 1,750 acres of public land between the North Pole Ridge WSA and the Thirtymile WSA as suitable for wilderness designation and combining the Lower John Day, Thirtymile and North Pole Ridge WSAs into one larger area. This possibility was considered earlier in the study process and determined to not be feasible because of the existing 36-inch buried gas pipeline and adjacent maintenance road. Use and maintenance of this road will continue and possibly increase with construction of an additional pipeline through this corridor in the future.

All Wilderness

Under the all wilderness alternative, all 6,369 acres of public land in the North Pole Ridge WSA would be recommended as suitable for wilderness designation (see Map 2). The south and west boundary of the WSA would be private land. The north and east boundary would be a continuation of private land and low standard dirt roads. For purposes of analysis, it is assumed the 240 acres of private inholdings and mineral estate of the 120 acres of split-estate land would not be acquired. A total of 2.9 miles of ways would be closed. The 6.2 miles of the John Day River in the WSA would be closed to motorized watercraft, in coordination with the Oregon State Marine Board.

Energy and Mineral Development Actions

Wilderness designation would close 6,249 acres within the WSA to mineral entry. Split-estate land totaling 120 acres would be open to mineral exploration and development. Surface-disturbing exploration and development of oil and gas and metallic minerals would be prohibited on 6,249 acres, 1,037 acres more than are presently protected by a "no surface occupancy" stipulation.

The 120 acres of split-estate lands within the WSA have moderate potential for the occurrence of oil and gas. However, in the absence of known oil and gas deposits, development is not anticipated on these small parcels. No mineral exploration or development is projected to occur on the public or split-estate lands because of the sporadic and speculative nature of the mineral resource.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Due to human safety and private property considerations, wildfires would be aggressively fought within the WSA. If wildfires were allowed to burn, the potential for escape onto private agricultural land would be extremely high. These 500 acres would replace those acres which would not be allowed to burn naturally. One-time prescribed burning of 500 acres is projected for the western portion of the WSA to maintain fire-dependent ecosystems.

Livestock Management Actions

Livestock use would remain at the present level of approximately 337 AUMs in portions of three grazing allotments. The season of use would remain as depicted in Table 4. One-half mile of riparian fence would be constructed to improve the ecological status of the riparian zone on 0.75 mile of the John Day River. For purposes of analysis it is assumed the fence would be allowed since it would not accommodate increased grazing but is necessary to restore the riparian areas degraded by livestock. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 2.9 miles of ways. Livestock management and maintenance of 1.8 miles of fence would be conducted primarily from horseback. Mechanized heavy equipment would be permitted, once every 10 to 15 years to maintain one reservoir.

Recreation Management Actions

The entire 6,369 acres in the North Pole Ridge WSA would be closed to vehicle use and 2.9 miles of ways would be closed. Six miles of the John Day River would be closed to motorized watercraft use. Current recreation use is estimated to be 10,000 visitor days per year. Most of this current use utilizes nonmotorized boats for access to camping, fishing and some hunting, since there is no legal public vehicular access to the WSA. Some vehicle use occurs from adjacent landowners and those with landowner permission who have access across private land and through a locked gate into Pine Hollow Canyon.

Proposed Action

Under the proposed action, 5,830 acres would be recommended as suitable for wilderness designation (see Map 3) and the remaining 539 acres in the north part of the WSA near Pine Hollow Canyon would be recommended as nonsuitable.

The boundary on the south and west side of this WSA would be private land. The boundary on the east would be a combination of private land and a low standard road. The north boundary between the suitable and nonsuitable portions would be a way on the top of North Pole Ridge. The boundary of the WSA would also be modified to include one additional 40-acre private parcel adjacent to the WSA. An attempt would be made to acquire this parcel, the 240 acres of private inholdings and the 120 acres of mineral estate through purchase or exchange with willing owners.

Total area recommended suitable under this alternative, assuming acquisition of the private parcels would be 6,110 acres.

A total of 2.4 miles of ways would be closed and 6.2 miles of the John Day River would be closed to motorized watercraft, in coordination with the Oregon State Marine Board.

Energy and Mineral Development Actions

Wilderness designation would close 6,110 acres to energy and mineral entry, assuming acquisition of 280 acres of private land and 120 acres of mineral estate. This is 898 acres more than is presently protected by existing "no surface occupancy" stipulations. In the northwestern part of the WSA, 539 acres recommended as nonsuitable would be open to energy and mineral entry.

Exploration and development for oil and gas would be permitted on 539 acres. Projected exploration and development would involve seismic surveys, drilling one well, and construction of approximately 0.3 mile of access road and pipeline. Total surface disturbance would be five acres in the nonsuitable portion of the WSA. No exploration or development of mineral resources is projected within the WSA because of the sporadic and speculative nature of the resource in this area.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Due to human safety factors, wildfires would be aggressively fought within the WSA. If wildfires were allowed to burn, the potential for escape onto nearby private agricultural land would be extremely high. One-time prescribed burning of 500 acres is projected in the western portion of the WSA to maintain fire-dependent ecosystems. These 500 acres would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

In the area recommended suitable for wilderness designation, livestock use would remain at the current level of 310 AUMs in portions of three grazing allotments. The season of use would remain as shown in Table 4. One-half mile of riparian fence would be constructed to improve the ecological status of the riparian zone on 0.75 mile of the John Day River. For purposes of analysis, it is assumed the fence would be allowed since it would not accommodate increased grazing but is necessary to restore the riparian areas degraded by livestock. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 2.4 miles of ways. Livestock management and maintenance of 1.8 miles of fence would be conducted primarily from horseback. Mechanized heavy equipment would be permitted once every 10 to 15 years to maintain one reservoir.

In the 539 acres recommended nonsuitable for wilderness, livestock use would remain at the current level of 27 AUMs in the portion of the one grazing allotment. The season of use would remain as shown in Table 4. Vehicle use for day-to-day livestock management would be allowed on 0.5 miles of way, although much of the livestock management would continue to be done primarily from horseback.

Recreation Management Actions

Under this alternative, 6,110 acres recommended suitable for wilderness designation would be closed to motorized vehicle use and 2.4 miles of ways would be closed. In addition, 6.2 miles of the John Day River within the WSA would be closed to motorized watercraft use. Current recreation use of this area is estimated to be 10,000 visitor days per year for camping, fishing and hunting. Lack of legal vehicular access precludes vehicle use by all but adjacent landowners and those with landowner permission. The existing vehicle use is limited to the existing ways through vehicle designations. A total of 0.5 mile of way would remain open for vehicle use in the 539 acres recommended nonsuitable for wilderness.

Partial

Under the partial alternative, 5,332 acres of public land (the portion of the WSA visible from the river) would be recommended suitable as wilderness (see Map 4).

The boundary would follow the primary canyon rim and private land on the west side, private land on the south, a combination of private land and a low standard road on the east and private land on the north.

All but 80 acres of private inholdings would be outside the area recommended suitable under this alternative. For purposes of analysis it is assumed the private inholdings in the suitable area would not be acquired. An attempt would be made to acquire the 120 acres of mineral estate. A total of 2 miles of ways would be closed and six miles of the John Day River would be closed to motorized watercraft in coordination with the Oregon State Marine Board.

The 1,037 acres recommended nonsuitable lie outside the area that can be seen from river level. These lands are beyond the rims of the John Day River Canyon and include portions of Big Gulch, Little Gulch and Zig Zag Canyon.

Energy and Mineral Development Actions

Wilderness designation would close 5,332 acres within the WSA to energy and mineral entry assuming acquisition of mineral estate on 120 acres of split-estate land. This is 120 acres more than the acreage protected from surface disturbance through existing "no surface occupancy" stipulations. The remaining 1,037 acres recommended nonsuitable would be open to energy and mineral entry.

Exploration for oil and gas would be permitted on 1,037 acres. Projected exploration and development would involve seismic surveys, drilling one well, and construction of approximately 0.3 mile of access road and pipeline. Total surface disturbance would be five acres in the nonsuitable portion of the WSA.

Rock chip samples indicate a moderate potential for gold/silver in the WSA. It is projected that, due to the speculative nature of the occurrence, no development is expected.

Wildlife Habitat Management Actions

Habitat would be managed both within and outside the suitable area to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Due to human safety factors, wildfires would be aggressively fought within the WSA. If wildfires were allowed to burn, the potential for escape onto nearby private agricultural land would be extremely high. One-time prescribed burning on 500 acres is projected in the western portion of the WSA recommended suitable to maintain fire-dependent ecosystems. These 500 acres would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

In the area recommended suitable for wilderness designation, livestock use would remain at the current level of 247 AUMs in portions of three grazing allotments. The season of use would remain as in Table 4. One-half mile of riparian fence would be constructed to improve the ecological status of the riparian zone on 0.75 mile of the John Day River. For purposes of analysis it is assumed the fence would be allowed since it would not accommodate increased grazing but is necessary to restore the riparian areas from continued degradation by livestock. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 2 miles of ways. Livestock management and maintenance of 1 mile of fence would be conducted primarily from horseback. Mechanized heavy equipment would be permitted once every 10 to 15 years to maintain one reservoir.

In the 1,037 acres recommended nonsuitable for wilderness, livestock use would remain at the current level of 90 AUMs in portions of three grazing allotments. The season of use would remain as shown in Table 4. Vehicle use for day-to-day livestock management would be allowed on 0.9 mile of ways, although much of the livestock management and maintenance of 0.8 mile of fence would continue to be done primarily from horseback.

Recreation Management Actions

Under this alternative, 5,332 acres would be closed to vehicle use and 2 miles of ways would be closed to vehicle traffic. Current recreation use of this area is estimated to be 10,000 visitor days per year for river-based recreation activities. Existing vehicle use occurs by private landowners and those with access through the locked gate into Pine Hollow Canyon. This existing use is limited to the existing ways through vehicle designation. A total of 0.9 mile of ways would remain open for vehicle use in the 1,037 acres recommended nonsuitable.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 6,369-acre WSA would be open to mineral entry. Of this total, 1,037 acres are located outside the area currently protected by restrictive lease stipulations and would thus, be open to energy entry.

A moderate potential for oil and gas would initially be explored by seismic surveys. Surface disturbance from the surveys would be negligible. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. One well is projected to be drilled, requiring 0.3 mile of access road and pipeline. Total surface disturbance would be five acres in the WSA.

The entire WSA has a moderate potential for the occurrence of metallic mineralization (gold and silver). It is projected that exploration for these deposits would occur, involving geochemical sampling with limited surface disturbance. Due to the speculative nature of this occurrence, development is not expected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Due to human safety factors, wildfires would be aggressively fought within the WSA. If wildfires were allowed to burn, the potential for escape onto nearby private agricultural land would be extremely high. Prescribed burning on 2,300 acres would be initiated to maximize wildlife diversity and maintain fire-dependent ecosystems.

Livestock Management Actions

Livestock use would remain at the present level of approximately 337 AUMs in portions of three grazing allotments. The season of use would be changed to a rotational grazing system which awards grazing the area during the critical growing season (April, May and June).

A total of 0.5 miles of riparian fence and 2.6 miles of management fence would be constructed to improve vegetative condition through better management of livestock grazing.

Vehicle use on 2.9 miles of ways would continue for livestock management and fence maintenance purposes, amounting to approximately ten trips per year.

Recreation Management Actions

Vehicle use would continue on 2.9 miles of ways in the WSA but would remain limited by vehicle designation and the use of ways continuing to be controlled by private land and locked gates. The current recreation use level of this area is estimated to be 10,000 visitor days per year for river-based recreation activities, including boating, fishing, sightseeing, camping and hunting.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

Introduction

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Almost all of the North Pole Ridge WSA appears to be in a natural condition and primarily affected by the forces of nature. Unnatural interior features influence approximately 26 percent of the WSA.

Unnatural features in the WSA include 1.8 miles of fence, one reservoir and 2.9 miles of ways. These developments are dispersed mainly along the ridgetops, in side canyons and at isolated locations along the John Day River.

Naturalness in the northern portions of the WSA are also reduced by a buried gas line utility corridor located along the north boundary of the WSA in Pine Hollow Canyon. The adjacent maintenance road is readily visible from approximately 550 acres.

Most vehicle ways are reverting to a natural condition and are becoming less apparent. However, an old constructed way leading down from the top of the canyon to the John Day River (established to study a potential dam site at "The Narrows") is still apparent. Although erosion and vegetation are slowly reverting this way to a more natural appearance, the way will remain apparent in the long term.

Except for the constructed way, these unnatural features do not dominate the landscape due to their size and type, topographic screening, the size and shape of the WSA and the dispersal of these developments throughout the WSA. Floating recreationists encounter very few such features along the river at any one time since the meandering of the John Day River creates many bends with few straight stretches. This allows visitors to float or hike in an area that generally remains in a natural condition.

Unnatural features outside of the WSA that adversely affect its naturalness include the sounds of the Kent natural gas booster station, located approximately 5 miles west of the WSA, associated maintenance activities on the natural gas pipeline along the northern boundary of the WSA, sights and sounds of ranching activities on Thirtymile Creek north of the WSA and periodic low elevation military jet flights in the canyon. The northern part of the WSA is the area predominantly affected by these features. The jet flights affect the entire WSA but are temporary in nature.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Outstanding opportunities for solitude exist in most of the WSA, particularly within the main canyon of the John Day River. There are also outstanding opportunities for solitude in most of the isolated side canyons and on some plateaus within the study area.

A unique type of solitude can be obtained by floating or hiking within the study area. The reddish brown basalt canyons range in depth from 800 to 1,600 feet and totally engulf the individual, giving one a complete feeling of being alone.

Occasional motorized watercraft use on the John Day River adversely affects solitude within the WSA. The noise of a boat motor can be heard for miles in the otherwise quiet canyon.

There are six areas outside the main canyon with secluded spots. These areas include portions of the South Fork of Pete Enyart, Big Gulch, Little Gulch and Zig Zag canyons, a ravine near the southern boundary and a high plateau over 1,800 feet above the John Day River along the southern boundary.

Outstanding opportunities for primitive and unconfined recreation within the WSA include whitewater boating on the John Day River by raft, drift boat, canoe or kayak during the late spring and early summer months (a period of three to four months depending on river levels). Factors which make this opportunity outstanding are: a variety of fast to slow moving water intermixed with a few challenging rapids within the WSA; outstanding scenic quality of the John Day River canyon while floating through the WSA; opportunities to fish, camp and view wildlife and historic, geologic and archeological sites; and the opportunity to see an area that is predominantly unimpaired in its natural beauty and character.

In addition, opportunities exist to experience a two to four-day river trip, or longer if desired. While one can float through the study area in two to three days, limitations on access to the river require a much longer trip.

There are fishing opportunities for smallmouth bass, squawfish, bullhead, channel catfish, carp, chinook salmon and steelhead along the river within the WSA. Seven side canyons of the John Day River within the study area offer outstanding day hikes. Opportunities for sightseeing and photography of the features mentioned above are also outstanding. This area offers opportunities for backpacking, camping, wildlife observation, hunting, and horseback riding; however, they are less than outstanding.

Special Features

There are several special wilderness features in the WSA (see Map 2). The North Pole Ridge WSA lies within one of the largest continental basalt flow formations in the world, the Columbia River Basalt Formation. The John Day River cut a dramatic cross section through this plateau as it formed the John Day Canyon. This is especially evident at the Red Wall, a highly scenic section of the John Day Canyon within the WSA.

The WSA contains 6.2 miles of the John Day River with scattered wet areas of lush vegetation which contrast against an otherwise dry landscape. The John Day River provides aquatic habitat for steelhead trout and chinook salmon (some of Oregon's few remaining native salmonid runs).

Prehistoric sites which offer special opportunities for cultural resource studies have been found within the WSA. Some sites are so significant that they have been proposed for a National Register district. (see the Cultural Resources section for further information.)

The WSA contains vegetation representative of a potential natural community (PNC) bluebunch wheatgrass ecosystem. (PNC is the relatively stable, final stage in the succession of vegetation types, generally equated with pristine.) There are opportunities to study native range sites which could be useful for vegetative comparison and could be maintained as pristine plant reserves. In addition, several plant species of special interest are known or suspected to occur in the WSA. (These plants are discussed further in the Vegetation section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the North Pole Ridge WSA is located within the Palouse Grassland Province and the potential natural vegetation is sagebrush steppe and wheatgrass-bluegrass. Of the vegetative communities listed in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan, the WSA contains the big sagebrush/bluebunch wheatgrass, big sagebrush/Idaho fescue, rigid sagebrush/Sandberg's bluegrass, bluebunch wheatgrass/Sandberg's bluegrass, and Idaho fescue/bluebunch wheatgrass ecosystems.

There are six standard metropolitan statistical areas with populations over 100,000 within five hours' drive of the North Pole Ridge WSA: Eugene/Springfield, Portland and Salem, Oregon; and Richland/Kennewick/Pasco, Yakima and Tacoma/Seattle/Everett, Washington.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of reconnaissance geochemical rock chip sampling. Technical details of the findings of the evaluation are found in a BLM report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Lower John Day River Geologic Resource Area". The WSA is within the Lower John Day River geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume. Table 3 shows the energy and mineral potential classifications for the WSA.

Exposed rocks in the WSA are Tertiary flood-type basalt flows. The subsurface rocks are inferred from oil and gas exploration wells to include Cretaceous marine clastic sediments and pre-Cretaceous marine sediments and metamorphosed sediments.

Energy Resources

Oil and gas has a moderate potential for occurrence based on several positive factors. Several oil and gas exploration wells have been drilled south of the WSA with one of the wells recovering gas. In the same area there are three reported asphalt occurrences. Near Condon, a deep well had a slight oil show. The discovery of subcommercial gas in Washington beneath the Columbia River Basalt Group indicates gas was generated and preserved in areas similar to the WSA. The combination of surface and subsurface hydrocarbon shows, surface and subsurface geology and current oil and gas leasing all lead to a moderate potential for the occurrence of oil and gas in the WSA.

Current management restricts oil and gas exploration and development in the area seen from the John Day River by stipulating "no surface occupancy" on all leases. There are 1,037 acres outside this viewable area which are not restricted by this stipulation.

As of October 16, 1987, a total of 680 acres in the southwest portion of the WSA were leased for oil and gas. There were no geothermal leases in the WSA as of October 16, 1987.

Mineral Resources

Rock chip samples indicate a moderate potential for occurrence of gold and silver in the WSA. No deposits of strategic and critical minerals are known to exist. As of October 16, 1987, twenty-four post-FLPMA mining claims, located after October 21, 1976, were filed on a portion of the WSA. The claims are located in the southeast portion of the WSA in Sections 29 and 31, T. 5 S., R. 19 E.

Vegetation

The predominant vegetation in the WSA is big sagebrush/bunchgrass with a few communities dominated by rabbitbrush or snakeweed. To a much lesser extent, there is a scattering of juniper/big sagebrush communities.

The rolling hills and plateaus above the drainages are usually dominated by big sagebrush on deeper soils with low and/or stiff (rigid) sagebrush on shallower soils. Associated understory species include bluebunch wheatgrass, Thurber's needlegrass, Idaho fescue, squirreltail, Sandberg's bluegrass, cheatgrass, phlox, biscuitroot, buckwheat and aster.

The ecologic status varies from early seral to late seral with mostly a static trend.

Bunchgrass communities are found on the steep slopes and some of the plateaus in the canyons. Most of these communities are in late seral or PNC status, since livestock use in these zones is very limited or nonexistent. These communities consist mainly of bluebunch wheatgrass and big sagebrush with Idaho fescue on some of the north slopes.

Riparian vegetation along the John Day River is in early seral condition with static trend. The vegetation includes sedges, rushes, willow, mock orange, red osier dogwood, wild rose and blackberry.

The ephemeral drainages not supporting riparian vegetation are dominated by big sagebrush/bunchgrass communities with some juniper/big sagebrush/bunchgrass areas along the John Day River, generally in early seral condition. The trend of these communities is mostly static.

Several plant species of special interest are suspected of occurring or known to occur in the WSA: *Castilleja xanthotricha* (yellow-hairy Indian paintbrush) is known to occur, and *Collomia macrocaly* (bristle-flowered collomia) and *Rorippa columbiae* (Columbia cress) are suspected of occurring. All are candidates for Federal listing as threatened or endangered. In addition, *Pediocactus simpsonii var. robustior* (hedgehog cactus) and *Claytonia umbellate* (umbellate spring beauty) are two plant species of special interest which are known to occur in the WSA.

Wildlife

Most of the WSA is within a deep canyon. Extensive diversity of wildlife habitat is provided by the mixed sagebrush/grass sidehills and rock outcrops of the canyon walls. Riparian habitat is found the entire length of the WSA along the John Day River.

Since most of the vegetation in the WSA is in late seral status or PNC, wildlife habitat is good. Riparian habitats are the primary exception since they generally are in an early seral status. A representative sampling of species utilizing this WSA are mule deer, chukar, golden eagles, prairie falcons, bobcats, tree and cliff swallows, long eared owls, Canada geese, mallard ducks, redwinged blackbirds, beaver and mink. The bald eagle is a winter resident. Fisheries in this WSA are significant with smallmouth bass, rainbow trout, steelhead and chinook salmon being the primary game species and northern squawfish, brown bullheads and suckers the most common nongame species. Portions of the WSA have been identified as suitable for reintroduction of California bighorn sheep.

Watershed

The WSA contains approximately 6.2 miles of the John Day River. The water quality is low most of the year, and some bank trampling is caused by livestock in a few areas which increases the turbidity of the river. The condition of the upland watershed is generally good.

Livestock Grazing

Portions of three grazing allotments are in the WSA and Table 4 summarizes the livestock use.

Existing livestock developments include 1.8 miles of fence and a reservoir.

The 2.9 miles of way in the WSA are used primarily for general livestock supervision and inspection and repair of existing fences. Most of the everyday livestock work requires horses due to the lack of vehicular access. It is estimated that livestock operators make approximately ten trips per year by vehicle into the WSA for livestock management purposes.

Cultural Resources

Information about cultural resources in the WSA was collected during field surveys in the John Day River Canyon in 1976 and has been updated through monitoring. Six prehistoric sites, consisting of five pithouse villages and one rock feature site, have been recorded. Most are potentially eligible as a National Register district. These sites are in excellent condition and have high research potential. Illegal excavation by artifact collectors is the greatest threat to their integrity.

Recreation Use

Recreation use in this WSA includes whitewater boating, camping, fishing, hunting, sightseeing, photography and some hiking. A limited but increasing amount of motorized watercraft use is also known to occur. There is no legal public access into the WSA except by boat. Some people use the ways with permission from adjacent private landowners.

Overall recreation use in the WSA is estimated to be 10,000 visitor use days per year. Most of the boating and smallmouth bass fishing occurs in April, May and June. Chukar hunting occurs in October. Steelhead fishing occurs in November, December and January and is increasing in popularity. The WSA is used year-round by recreationists with 75 percent of the use occurring in the spring.

Local Personal Income

Livestock use at the current level of 337 AUMs and recreation use totaling 10,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $4,000 for livestock grazing and $120,000 related to recreation use of the WSA, for an overall total of $124,000. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness Alternative

Recommended suitable for wilderness: 6,369 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

Wilderness values within the entire 6,369 acres would be protected by legislative mandate through wilderness designation. Wilderness values such as naturalness and outstanding opportunities for primitive and unconfined recreation and solitude would be preserved.

Special features, including outstanding scenery and undeveloped plateaus and canyons, riparian areas, aquatic habitat for steelhead trout and chinook salmon, cultural sites and sensitive plant species, would be further protected.

Naturalness

The naturalness of the area's undisturbed John Day River canyon, side canyons and plateaus (74 percent of the WSA is pristine, uninfluenced by any unnatural features) would be enhanced by prohibiting vehicle use. Closure of 2.9 miles of ways within this WSA, influencing approximately 1,200 acres (19 percent of the WSA), would allow these ways to revegetate.

The proposed 0.5 mile of riparian fence along the John Day River would likely be allowed because it would protect natural processes, help restore deteriorated habitat and generally be compatible with the wilderness character of the area. The fence, an unnatural feature in itself, would influence approximately 76 acres within the immediate area along this river segment (one percent of the WSA).

Prescribed burning of 500 acres to enhance wildlife diversity would be noticeable in the short term. In the long term, naturalness would be improved through restoration of a fire-dependent ecosystem.

Solitude

Existing opportunities for solitude provided by the area's large size, 6.2 miles of the John Day River and its canyon, numerous side canyons and limited vehicle access would be enhanced by the elimination of motorized vehicle and watercraft use. This reduction in vehicle access would provide a larger interior area for visitors to hike into and experience solitude without disturbance from vehicles.

Primitive and Unconfined Recreation

Closure of 2.9 miles of ways to motorized vehicle use would increase opportunities for hiking, camping, photography, backpacking and other primitive and unconfined recreation activities. The quality of sightseeing and birdwatching would also improve by eliminating vehicle use on these ways and allowing them to revegetate. A more natural and primitive setting would be provided.

The 0.5 mile of riparian fence would also enhance fishing and hunting opportunities along the John Day River by improving wildlife habitat and fisheries quality. Recreation opportunities would increase as wildlife populations increased.

Special Features

Eliminating motorized vehicle use on 2.9 miles of ways and allowing the ways to revegetate would preserve and enhance special features by eliminating the effects of their unnatural lives on the scenic vistas, by reducing access to cultural sites and by reducing disturbance to wildlife. Riparian fence construction would result in enhancement of the scenic qualities by improving vegetative condition and increasing opportunities to view wildlife.

Conclusion: Wilderness designation of the entire 6,369 acres within the North Pole Ridge WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 6,249 acres within the WSA to mineral entry. The 120 acres of split-estate in the WSA would be open to mineral exploration.

Energy Development

Surface-disturbing exploration and development of oil and gas in the WSA would be prohibited on 6,249 acres. This is 1,037 acres more than is currently protected by restrictive lease stipulations. Projected development of one production well would be precluded. The split-estate land would be open to energy exploration but development on this land is not projected due to a lack of geologic evidence justifying development of this parcel.

Conclusion: Production from one projected oil and gas well would be foregone.

Mineral Development

Due to the speculative nature of metallic minerals in the WSA, no exploration or development is projected.

Conclusion: No impacts to metallic mineral production are expected.

Impacts on Vegetation

The bunchgrass communities on 500 acres treated by prescribed burning presently in upper mid-seral to lower late seral status would change to or be maintained in, late seral status. The sagebrush component would be reduced or eliminated in these areas. Riparian vegetation along 0.75 mile of the John Day River would change from early seral status to late seral status in the long term through livestock exclusion, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. Residual ground cover would increase in both the burned and excluded areas. Revegetation would begin to occur in two to three years on 2.9 miles of ways closed to vehicle traffic. Vegetation in the remainder of the WSA (approximately 5,800 acres) would not change.

Conclusion: The sagebrush-bunchgrass community on 500 acres would change to a primarily bunchgrass community through prescribed burning. Riparian vegetation on 0.75 mile of stream would improve. Little or no change would occur to vegetation on the rest of the area.

Impacts on Wildlife

Wildlife habitat and forage for approximately 110 mule deer and other wildlife species would be maintained under wilderness designation. Disturbances to wildlife species would be reduced through closure of 2.9 miles of ways to motor vehicles. Fisheries as well as cover and forage conditions for mule deer and other wildlife species on 0.75 mile of the John Day River would improve through construction of 0.5 mile of riparian fence and the subsequent exclusion of livestock. Due to the dependence of mule deer on riparian zones for summer habitat, a minor obstacle to deer movement would be presented by this fencing. Habitat diversity would be maintained through 500 acres of prescribed burning.

Conclusion: Wildlife habitats and wildlife populations including mule deer, bald and golden eagles would be maintained on 6,369 acres designated wilderness. Riparian habitat along 0.75 mile of the John Day River would be improved and 500 acres of upland habitat would be maintained.

Impacts on Watershed

Three-quarters of a mile of streambank would be stabilized through the exclusion of livestock. The reduction in streambank trampling and the corresponding increase in riparian vegetation would reduce the amount of sediment deposited in the John Day River. Given the total flow of the John Day River system however, any increase in water quality as a result of this action would be minimal. There would be no change to upland watershed conditions.

Conclusion: Stabilization of 0.75 mile of bank along the John Day River would result in a minimal improvement in water quality.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 337 AUMs in portions of the three grazing allotments. Vehicle use for day-to-day livestock management and facility inspection and maintenance would be precluded on 2.9 miles of ways, resulting in some inconvenience and additional expense to the livestock operators. Mechanized heavy equipment would be permitted on the ways once every 10 to 15 years to maintain the existing reservoir.

Conclusion: Livestock use would not change. Vehicle use for routine livestock-related activities would be precluded on 2.9 miles of ways, resulting in slight inconvenience and increased expense to the operators.

Impacts on Recreation Use

Vehicle-oriented recreation use by anglers and hunters would be displaced since all 2.9 miles of ways would be closed. The impact on this form of recreation would be negligible since the use of ways is tightly controlled by gates and private property surrounding this WSA. Motorized watercraft use would be eliminated on the John Day River within the WSA. Overall the numbers and types of activities would not change since the majority of recreation use is river oriented and primitive in nature. There may be a slight increase in the quality of fishing and hunting due to the fact that ways would be closed to private users and motorized watercraft would no longer be allowed in the area.

Conclusion: The area's recreation use level of 10,000 visitor days per year would not be affected and would continue to increase at a rate of five to ten percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 337 AUMs. Overall recreation use would remain at 10,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $124,000.

Proposed Action

Recommended suitable for wilderness: 5,830 acres (6,110 acres assuming acquisition of 280 acres of private land from willing landowners).

Recommended nonsuitable for wilderness: 539 acres

Impacts on Wilderness Values

The proposed action alternative would add 6,110 acres to the NWPS assuming acquisition of 280 acres of private inholdings. The mineral estate on 120 acres of split-estate land would also be acquired. A total of

2.4 miles of ways within this WSA would be closed. Wilderness values within this area would be protected by legislative mandate.

Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including habitat for steelhead and chinook salmon, riparian habitat, cultural resources, outstanding scenery and vegetative communities would also be protected. Acquisition of the 280 acres of private lands and 120 acres of non-Federal mineral estate would prevent possible disturbance from energy or mineral exploration and ensure the preservation of naturalness and opportunities for solitude and primitive and unconfined recreation.

The 539 acres recommended nonsuitable for wilderness would not receive special legislative protection. Limited wilderness values of naturalness, solitude and primitive and unconfined recreation would be vulnerable to the effects of projected management actions such as energy development and mineral exploration and continued vehicle use on 0.5 miles of vehicle ways.

Naturalness

For the 6,110 acres recommended suitable for wilderness, the effects on naturalness would be similar to the all wilderness alternative except the proposed action would include acquisition of 280 acres of private land and 120 acres of non-Federal mineral estate. Impacts from projected mineral entry, exploration or other activities affecting naturalness would not occur and the naturalness of the area would be preserved.

Closing 2.4 miles of ways would allow revegetation which would eventually eliminate most of the ways' unnatural appearance, influencing approximately 1,000 acres.

Prescribed burning of 500 acres to enhance wildlife habitat diversity would be noticeable in the short term. In the long term this treatment would eventually improve naturalness through restoration of a fire-dependent, native bunchgrass ecosystem.

The riparian fence along a portion of the John Day River would enhance riparian habitat but would add the unnatural feature of 0.5 mile of fence which would visually influence approximately 76 acres (one percent of the WSA).

Within the 539 acres recommended nonsuitable for wilderness, the projected development of one oil and gas well with the associated .3 mile of road and pipeline would directly affect naturalness on five acres and visually impair naturalness on 200 acres.

Solitude

In the area recommended suitable for wilderness, the effects on solitude would be similar to the all wilderness alternative. In addition, precluding mineral entry and exploration on 280 acres of private land and 120 acres of non-Federal mineral estate through acquisition would enhance solitude opportunities by increasing the size of the area where the visitor's solitude would not be impaired by projected exploration activity.

In the 539 acres recommended nonsuitable for wilderness, continued vehicle use on 0.5 mile of way and human activities related to projected energy development would cause repeated impairment of opportunities for solitude within and adjacent to areas where these activities would occur.

Primitive and Unconfined Recreation

Within the area recommended suitable for wilderness, the same increase in opportunities for primitive and unconfined recreation as in the all wilderness alternative, resulting from closure of 2.4 miles of ways and riparian fence construction, would occur. In addition, acquisition of the 280 acres of private land and 120 acres of mineral estate would result in long-term preservation of opportunities for primitive and unconfined recreation on these lands which are important because they are located on or near the John Day River where most recreational activities occur. Projected energy exploration would be prohibited on these lands ensuring preservation of a natural setting where primitive recreation opportunities would be available.

Within the 539 acres recommended nonsuitable for wilderness, vehicle use on 0.5 mile of way would continue to intrude on primitive, nonmotorized recreation opportunities in the area. Projected energy development would reduce the natural setting and further impact these opportunities.

Special Features

The impacts to special features would be similar to the impacts identified under the all wilderness alternative but there would be enhancement by the acquisition of 280 acres of private land and 120 acres of mineral estate on split-estate land. Projected energy exploration on these lands would be precluded. Areas remaining in a natural condition and containing scenic values, such as the John Day River Canyon, would remain in their present condition.

The closure of 2.4 miles of ways would eliminate disturbance of wildlife and allow the ways to revegetate which would eliminate the effects to their unnatural lines on scenic values and limit access to cultural sites. The riparian fence would result in enhancement of scenic qualities by improving vegetative condition and wildlife habitat with an increase in opportunities to view wildlife.

Special features would not be affected in the area recommended nonsuitable for wilderness since none are known to exist in the area.

Conclusion: Wilderness designation of 6,110 acres would protect and enhance existing wilderness values. The acquisition of 280 acres of private land and 120 acres of mineral-estate land would further enhance the area by preserving wilderness values on all land within the wilderness boundary. Within the 539-acre area recommended as nonsuitable for wilderness, projected activities would impair the limited wilderness values an approximately 200 acres with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 6,110 acres to energy and mineral entry, assuming acquisition of 280 acres of private land and 120 acres of mineral estate. The remaining 539 acres would be open for energy and mineral entry.

Energy Development

Surface-disturbing exploration and development for oil and gas would be precluded on 6,110 acres by wilderness designation. This is 498 acres more than is currently protected by restrictive lease stipulations. One projected oil and gas well would be drilled in the area recommended nonsuitable.

Conclusion: Production from the one projected oil and gas well would occur.

Mineral Development

Surface-disturbing exploration for metallic minerals would be precluded on 6,110 acres. Exploration could occur on the 539 acres recommended as nonsuitable. Due to the speculative nature of these deposits, no development is projected.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

In the area recommended suitable for wilderness, the bunchgrass communities on 500 acres, presently in upper mid-seral to lower late seral status, would change to, or be maintained in, late seral status through prescribed fire. The sagebrush component would be reduced or eliminated in these areas. Riparian vegetation along 0.75 mile of the John Day River would change from early seral status to late seral status in the long term through livestock exclusion, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. Residual ground cover would increase in both the burned and excluded areas. Revegetation would begin to occur in two to three years on 2.4 miles of ways closed to vehicle traffic. Vegetation in the remainder of this area (approximately 5,600 acres) would not change.

In the area recommended nonsuitable for wilderness, there would be no change to overall vegetation except for five acres disturbed by projected energy development.

Conclusion: The sagebrush-bunchgrass community on 500 acres would change to a primarily bunchgrass community through prescribed burning. Riparian vegetation on 0.75 mile of stream would improve. Five acres would be disturbed through energy development. Little or no change would occur to vegetation on the rest of the area.

Impacts on Wildlife

In the area recommended suitable for wilderness, wildlife habitat and forage for 100 mule deer as well as bald and golden eagles and other wildlife species would be maintained. Disturbances to wildlife would be reduced through closure of 2.4 miles of ways. Fisheries and riparian habitat would be improved through construction of 0.5 mile of fence and the subsequent exclusion of livestock. Due to the dependence of mule deer on riparian zones for summer habitat, the riparian fences would create a minor obstacle to deer movement. Habitat diversity would be maintained through 500 acres of prescribed burning.

In the area recommended nonsuitable for wilderness, wildlife habitat and forage for 10 mule deer and other wildlife species would be maintained. The five acres disturbed by projected energy development would have negligible effects on overall deer or other wildlife habitat. Disturbance to wildlife would continue to occur from motorized vehicles and from projected energy development activities.

Conclusion: Wildlife habitat and wildlife population levels would be maintained on 5,830 acres designated wilderness. Riparian habitat and fisheries would be improved on 0.75 miles.

Impacts on Watershed

Three-quarters of a mile of streambank would be stabilized through the exclusion of livestock. The reduction in streambank trampling and the corresponding increase in riparian vegetation would reduce the amount of sediment deposited in the John Day River. Given the total flow of the John Day River system, however, any increase in water quality as a result of this action would be minimal. There would be no change to upland watershed conditions.

Conclusion: Stabilization of 0.75 mile of bank along the John Day River would result in a minimal increase in water quality.

Impacts on Livestock Grazing

In the area recommended suitable for wilderness, livestock use would remain at the current level of 310 AUMs in portions of the three grazing allotments. Vehicle use for day-to-day livestock management and facility inspection and maintenance would be precluded on 2.4 miles of ways, resulting in slight inconvenience and additional expense to the livestock operators. Mechanized heavy equipment would be permitted on the ways once every 10 to 15 years, to maintain one reservoir.

For the area recommended nonsuitable for wilderness, livestock use would remain at the current level of 27 AUMs in the portion of one allotment. Vehicle use for day-to-day livestock management would be allowed on 0.5 mile of way.

Conclusion: Livestock use would remain at 337 AUMs. Vehicle use for routine livestock-related activities would be precluded on 2.4 miles of ways, resulting in slight inconvenience and additional expense to the operators.

Impacts on Recreation Use

In the 6,110 acres recommended as suitable, the closure of 2.4 miles of ways would reduce the limited recreation use by the hunters and anglers who had obtained permission from private landowners to use these private access routes to access the public land in the WSA. This reduction would be negligible since most recreation use of the WSA is boat-oriented. Motorized watercraft use on the John Day River would be precluded. This would have a negligible effect on overall boating use levels, because it is a small portion of the total boating use which occurs. The quality of hunting would increase as a result of the vehicle restrictions because of reduced disturbance by vehicles.

A natural setting for primitive recreational pursuits would be preserved by the acquisition of the mineral estate on 120 acres of split-estate land and aquisition of 280 acres of private inholdings, including a 40-acre tract surrounded by public land and adjacent to the WSA. Any increase in visitor use would be negligible and would offset the decrease due to limited vehicle access.

On the 539 acres recommended as nonsuitable, the existing limited amount of recreation use on 0.5 miles of ways and throughout this portion of the WSA would not change.

Conclusion: The area's recreation use level of 10,000 visitor days per year would not be affected and would continue to increase at a rate of five to ten percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 337 AUMs. Projected energy development would amount to one oil and gas production well. Overall recreation use would remain at 10,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $124,000.

Partial Wilderness

Recommended suitable for wilderness: 5,332 acres
Recommended nonsuitable for wilderness: 1,037 acres

Impacts on Wilderness Values

This alternative would add 5,332 acres to the NWPS. A total of 2 miles of ways would be closed to vehicle use. Wilderness values within the area would be protected by legislative mandate.

Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved in areas of the John Day River Canyon seen from the river. Wilderness values would be enhanced by prohibiting motorized watercraft and vehicle use and reducing the number of vehicle access points into the WSA. Closure of 2 miles of ways which visually influence approximately 830 acres (16 percent of the WSA) would allow these ways to revegetate. Wilderness values would also be preserved by acquiring 120 acres of subsurface mineral estate.

The remaining 1,037 acres in this WSA recommended nonsuitable for wilderness would not receive legislative protection. Although wilderness values in this portion of the WSA are limited, they would be subjected to the effects of projected management actions including energy development and continued vehicle use.

Naturalness

Within the area recommended suitable for wilderness, the one-time prescribed burning of 500 acres would be noticeable in the short term. In the long term, naturalness would be increased through the restoration of a fire-dependent native bunchgrass ecosystem. The riparian fence along a small portion of the John Day River would likely be allowed because it would protect natural processes and enhance riparian and wildlife habitat. The 0.5 mile of fence would be an unnatural feature and would have a slight visual impact on approximately 76 acres (one percent of the WSA). The closing of 2 miles of ways would allow revegetation which would reduce the amount of visual influence they presently have on approximately 840 acres.

In the area recommended nonsuitable for wilderness, projected energy development including one drill pad, 0.3 miles of access road and associated pipeline would directly impair naturalness on five acres and visually affect naturalness on 200 acres. Vehicle use on 0.9 miles of vehicle ways would continue to impact naturalness on approximately 375 acres (approximately seven percent of the WSA).

Solitude

Opportunities for solitude provided by the John Day River Canyon and associated tributary canyons would remain in the 5,332 acres recommended suitable for wilderness. Opportunities for solitude would be enhanced by eliminating motorized watercraft on 6.2 miles of the John Day River and motorized vehicle use on 2 miles of ways. This reduction in motorized vehicle access would provide a larger area where visitors could hike or boat into and experience solitude without disturbance from motorized activities.

Within the area recommended nonsuitable for wilderness, continued limited vehicle use on 0.9 miles of ways would continue to reduce solitude. Human activities related to projected energy development would impair opportunities for solitude on approximately 200 acres in the vicinity of these activities.

Primitive and Unconfined Recreation

Within the 5,332-acre area recommended suitable for wilderness, closure of 2 miles of ways to motorized vehicle use would increase primitive and unconfined recreation opportunities such as backpacking, hiking and camping. Eliminating vehicle use and allowing the vehicle ways to revegetate would increase the quality of photography, nature study and sightseeing. Construction of 0.5 mile of riparian fence along the John Day River would enhance fishing, wildlife viewing and hunting opportunities by improving wildlife habitat and fisheries quality.

Vehicle use would continue to intrude upon primitive, nonmotorized recreation opportunities within the 1,037 acres recommended nonsuitable for wilderness.

Special Features

Special features within the area recommended suitable for wilderness would be protected through closure of 2 miles of ways to vehicle use. Vehicle use on 0.9 mile of way would continue to impair visual quality and disrupt opportunities to view wildlife in the area recommended nonsuitable.

Conclusion: Wilderness designation of 5,332 acres within the North Pole Ridge WSA would protect and enhance existing wilderness values. In the 1,037-acre area recommended nonsuitable for wilderness, projected management activities would impair wilderness values over approximately 200 acres with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 5,332 acres within the WSA to energy and mineral entry, assuming acquisition of 120 acres of mineral estate. The remaining 1,037 acres would be open for energy and mineral entry.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 5,332 acres by wilderness designation. This is the same acreage currently protected by existing "no surface occupancy" stipulations. One projected oil and gas well would be drilled in the area recommended nonsuitable.

Conclusion: Production from the one projected oil and gas well would occur.

Mineral Development

Surface disturbing exploration for metallic minerals would be precluded on 5,332 acres. Exploration could occur on 1,027 acres recommended nonsuitable for wilderness. Due to the speculative nature of these deposits, no development is projected.

Conclusion: No impacts to mineral development is expected.

Impacts on Vegetation

In the area recommended suitable for wilderness, the bunchgrass communities on 500 acres, presently in upper mid-seral to lower late seral status, would change to, or be maintained in, late seral status through prescribed fire. The sagebrush component would be reduced or eliminated on these acres. Riparian vegetation along 0.75 mile of the John Day River would change from early seral status to late seral status in the long term through livestock exclusion, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. Residual ground cover would increase in both the burned and excluded areas. Revegetation would begin to occur in two to three years on two miles of ways closed to vehicle traffic. Vegetation in the remainder of this area (approximately 4,800 acres) would not change.

In the 1,037-acre area recommended nonsuitable, vegetation would not change except for five acres disturbed by projected energy development.

Conclusion: In the area recommended suitable for wilderness, the sagebrush-bunchgrass community on 500 acres would change to a primarily bunchgrass community through prescribed burning. Riparian vegetation on 0.75 mile of stream would improve. Little or no change would occur to vegetation on the rest of the area recommended as suitable for wilderness. In the area recommended nonsuitable, five acres would be disturbed by projected energy development.

Impacts on Wildlife

In the area recommended suitable for wilderness, wildlife habitat and forage for 90 mule deer and other wildlife species would be maintained. Disturbances to wildlife would be reduced through closure of two miles of ways. Fisheries and riparian habitat would be improved on 0.75 mile of the John Day River through construction of 0.5 mile of fence and the subsequent exclusion of livestock. Due to the dependence of mule deer on riparian zones for summer habitat, the riparian fences would present a minor obstacle to deer movement. Habitat diversity would be maintained through 500 acres of prescribed burning.

In the area recommended nonsuitable for wilderness, wildlife habitat and forage for 20 mule deer and other wildlife species would be maintained, due in part to the ruggedness and relative inaccessibility of the area. Minor disturbance to wildlife would continue on 0.9 mile of way and in the immediate area of projected energy development.

Conclusion: Wildlife populations including mule deer, bald and golden eagles would be maintained on 5,332 acres designated wilderness under this alternative. Riparian habitat along 0.75 mile of the John Day River would be improved and 500 acres of upland habitat would be maintained.

Impacts on Watershed

Three-quarters of a mile of streambank would be stabilized through the exclusion of livestock. The reduction in streambank trampling and the corresponding increase in riparian vegetation would reduce the amount of sediment deposited in the John Day River. Given the total flow of the John Day River system, however, any increase in water quality as a result of this action would be minimal. There would be no change to upland watershed conditions in the area recommended suitable.

In the area recommended nonsuitable, the projected drilling of one oil and gas well plus 0.3 mile of road and pipeline would affect five acres but would not change watershed conditions.

Conclusion: Stabilization of 0.75 mile of bank along the John Day River would result in a minimal improvement in water quality.

Impacts on Livestock Grazing

In the area recommended suitable for wilderness, livestock use would remain at the current level of 247

AUMs in portions of the three grazing allotments. Vehicle use for day-to-day livestock management and facility inspection and maintenance would be precluded on two miles of ways, resulting in slight inconvenience and additional expense to the livestock operators. Mechanized heavy equipment would be permitted on the ways once every ten to 15 years to maintain one reservoir. In the area recommended nonsuitable for wilderness, livestock use would remain at the current level of 90 AUMs in portions of three allotments. Vehicle use for day-to-day livestock management would be allowed on 0.9 mile of ways.

Conclusion: Total livestock use would remain at 337 AUMs. Vehicle use for livestock-related activities would be precluded on two miles of ways, resulting in slight inconvenience and additional expense to the operators.

Impacts on Recreation Use

For 5,332 acres recommended suitable for wilderness designation, the closure of two miles of ways would reduce the limited recreation use by the hunters and anglers who had obtained special permission to use these privately-controlled ways to access public land. A natural setting would generally be preserved and the existing recreation use level, which primarily involves nonmotorized activities, would remain. Motorized watercraft would be prohibited on the six miles of the John Day River within the WSA. The quality of hunting would increase through elimination of this motorized vehicle use as a result of reduced disturbance to wildlife.

For 1,037 acres recommended nonsuitable for wilderness designation, 0.9 mile of way would remain open for the limited vehicle use which is controlled by the private landowners. A low level of recreation use by the public would continue to occur in this area.

Conclusion: The area's recreation use level of 10,000 visitor days per year would not be affected and would continue to increase at a rate of five to ten percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 337 AUMs. Projected energy development would amount to one oil and gas production well. Overall recreation use would remain at 10,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level, plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $124,000.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 6,369 acres

Impacts on Wilderness Values

Under this alternative, none of the 6,369 acres would be designated wilderness and wilderness values of naturalness, solitude, primitive and unconfined recreation and the area's special features would be subject to the effects of projected management actions. These actions include surface disturbing energy and mineral exploration, projected development of one oil and gas well and construction of 0.5 miles of riparian fence and 2.6 miles of livestock management fence. Vehicle use limited to existing ways would continue.

Naturalness

Vehicle use on 2.9 miles of ways would continue the impact of the vehicles upon naturalness on approximately 1,200 acres (19 percent of the WSA). Most of this influence upon the area's naturalness would occur on the plateaus on both sides of the John Day River.

Surface disturbing energy exploration and development would cause short and long-term impacts to naturalness to areas not within sight of the river. (Existing "no-surface-occupancy" stipulations would prevent surface disturbance from oil or gas exploration and development within sight of the river). Projected oil and gas development would directly affect naturalness on 12 acres and visually influence naturalness on 600 acres. Prescribed burning of 2,300 acres would be noticeable in the short term. In the long term, naturalness would be increased through the restoration of a fire-dependent, native bunchgrass ecosystem. The construction of 0.5 mile of riparian fence adjacent to the John Day River would enhance and protect the naturalness of this riparian area. The fence, an unnatural feature in itself, would visually influence 76 acres (one percent of the WSA). The 2.6 miles of proposed management fence in other portions of the WSA would visually influence approximately 225 acres (four percent of the WSA).

Solitude

Continued vehicle use on 2.9 miles of ways and human activity associated with motorized recreation use, projected energy development and prescribed burning would cause repeated impairment of opportunities for solitude adjacent to the activity. Vehicle use primarily occurs on the plateaus on both sides of the John Day River Canyon. Opportunities for solitude in the unroaded core area and rugged meandering canyons would remain. Occasional motorized watercraft use would continue to disrupt solitude along the river and in areas within view of the river.

Primitive and Unconfined Recreation

Vehicle use would continue to be limited to the existing 2.9 miles of ways within this WSA and would continue to disrupt primitive, nonmotorized recreation opportunities in adjacent areas. Construction of the riparian fence would enhance opportunities for primitive and unconfined recreation such as wildlife observation, hunting, fishing, camping and photography in a generally natural setting as a result of improved vegetative condition in the fenced area. Projected energy exploration would reduce opportunities for primitive and unconfined recreation through disturbance of the natural setting and required vehicle access.

Special Features

Vehicle use of existing ways would maintain impacts on special features. The unnatural lines of these ways on the landscape would continue to reduce natural scenic vistas and outstanding river canyon scenery. Vehicle access to cultural sites would remain with vandalism continuing. Energy exploration and development would impair scenic vistas out of view of the John Day River. The riparian fence along a portion of the John Day River would allow restoration of the riparian area resulting in enhancement of wildlife and fisheries habitat.

Conclusion: In the absence of wilderness designation, projected management actions would directly and indirectly impair wilderness values on a long-term basis on approximately 500 acres (eight percent of the acreage of the WSA) with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire WSA would be open to energy and mineral entry.

Energy Development

Oil and gas exploration would be allowed on all 6,369 acres of the WSA, although all but 1,037 acres are presently protected by no-surface occupancy stipulations. Based on favorable geologic conditions combined with evidence from nearby drilling, development of one oil and gas well is projected.

Conclusion: Production from one projected oil and gas well would occur.

Mineral Development

Mineral entry would be allowed within the WSA. Based on the speculative metallic mineral potential, no development is projected.

Conclusion: There would be no impact to mineral development in the WSA.

Impacts on Vegetation

For 2,300 acres treated by prescribed burning, the bunchgrass communities in upper mid-seral to lower late seral status would change to, or be maintained in, late seral status. The sagebrush component would be reduced or eliminated on these acres. Ecological status of 2,000 acres of vegetation, much of which is within the area to be prescribed burned, is presently in early seral status. It would change to mid-seral status in the long term through changes in livestock season of use. Riparian vegetation along 0.75 mile of the John Day River would change from early seral status to late seral status in the long term through livestock management/exclusion, with a corresponding increase in sedges, rushes, alders, cottonwoods and willows. Residual ground cover would increase in the burned areas, the excluded areas and in those areas changing from early seral to mid-seral status. Vegetation would be disturbed on five acres through projected energy development. Vegetation in the remainder of the WSA (approximately 3,000 acres) would not change.

Conclusion: The sagebrush-bunchgrass community on 2,300 acres would change to a primarily bunchgrass community through prescribed burning. Seral status on 2,000 acres would change to mid-seral status through livestock management. Riparian vegetation on 0.75 mile of stream would improve. Little or no change would occur to vegetation on the rest of the area. Five acres would be disturbed through projected energy development.

Impacts on Wildlife

Prescribed burning would be accelerated to increase upland habitat diversity with 2,300 acres (approximately 40 percent of the WSA) burned in a 50-year period. As a result, wildlife habitat for the approximately 110 mule deer and other wildlife species would be maintained. Projected energy exploration and development activities and vehicle use would continue although both are minor and restricted to the immediate vicinity of the activity. Fencing and livestock grazing management in riparian areas would improve habitat for mule deer, bald and golden eagles, as well as other wildlife species.

Conclusion: Due to existing habitat conditions, little change other than maintenance of habitat diversity for mule deer, bald and golden eagles as well as other wildlife species would be expected under this alternative. Minor disturbances would occur due to energy and mineral activities and vehicle use.

Impacts on Watershed

Three-quarters of a mile of streambank would be stabilized through the management/exclusion of livestock. The reduction in streambank trampling and the corresponding increase in riparian vegetation would reduce the amount of sediment deposited in the John Day River. Given the total flow of the John Day River system, however, an increase in water quality as a result of this action would be minimal. For 2,000 acres of early seral status vegetation changed to mid-seral status through livestock management, upland watershed conditions would improve through an increase in herbaceous vegetation and ground cover. Infiltration would increase and runoff would decrease. The projected development of one oil and gas well plus 0.3 mile of road and pipeline would affect five acres but would not change watershed conditions.

Conclusion: Upland watershed improvement realized on 2,000 acres.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 337 AUMs in portions of three grazing allotments with changes in grazing systems to rotational grazing which avoids the critical growing season (April, May and June). Livestock management would be enhanced through construction of 2.6 miles of management fence and the resulting rotation grazing systems that could be implemented. Vehicle use for day-to-day livestock management and facility inspection and maintenance would continue on 2.9 miles of way.

Conclusion: Livestock use would remain at 337 AUMs. Vehicle use for livestock-related activities would continue on 2.9 miles of ways. Livestock distribution and management would improve.

Impacts on Recreation Use

Motorized recreation use would continue on 2.9 miles of ways at the discretion of adjacent landowners. Occasional motorized watercraft use would continue on the John Day River. Projected management actions would slightly disturb the natural setting but recreation use levels would continue to increase at five to ten percent per year and existing uses would continue.

Conclusion: The area's recreation use level of 10,000 visitor days per year would not be affected and would continue to increase at an annual rate of five to ten percent.

Impacts on Local Personal Income

Livestock grazing would remain at 337 AUMs. Projected energy development would amount to one oil and gas production well. Overall recreation use would remain at 10,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level, plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $124,000.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action, on the 6,110 acres recommended suitable for wilderness, surface disturbing exploration and development for energy resources would be foregone. Vehicle use would be excluded, reducing opportunities for those who prefer this type of recreation, including the use of motorized watercraft. There would be a slight increase in livestock management costs as a result of the closure of 2.4 miles of ways.

For the 539 acres recommended nonsuitable for wilderness, projected energy and range developments would lead to unavoidable adverse impacts to wilderness values as a result of five acres of surface disturbance which would visually influence approximately 500 acres.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action on the 6,110 acres recommended suitable for wilderness, most existing short-term uses would continue, with slight additional inconvenience and expense to livestock operators resulting from the exclusion of vehicles for day-to-day inspection activities. The long-term productivity of the wilderness values would be preserved.

For the 539 acres recommended nonsuitable for wilderness, all existing short-term uses would continue and future development options including projected energy and range developments would remain open.

Long-term productivity of wilderness values would be directly lost on five acres which would visually influence approximately 500 acres with surface disturbance from the projected energy and range development activities. Further declines from other uses over the long term would also occur.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of wilderness or other resources on the 6,110 acres designated as wilderness. Projected energy development would result in an irreversible commitment of the wilderness resource on 200 acres with oil and gas reserves produced from one projected well being irretrievably committed.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area would be manageable as wilderness under the all wilderness, proposed action and partial alternatives. However, projected energy exploration and development on split-estate lands would create manageability problems including impacts to the naturalness and solitude of the WSA within sight and sound of the activity.

Another factor complicating wilderness manageability is the existence of four private inholdings which are used for livestock grazing. This use could change in the future at the discretion of the landowner; however, there has been no indication that present use would change.

Rationale for Selection of the Proposed Action

The proposed action is recommended because the benefits of preserving wilderness values in the portion recommended suitable would outweigh the benefits of retaining options for development of potential energy resources.

The area recommended suitable provides a wilderness experience unique in this region. Floating or hiking through a major river canyon up to 1,600 feet deep in near natural condition is a rare opportunity. The area is characterized by steep, rocky bluffs and numerous side canyons which offer outstanding opportunities for solitude and a wide range of primitive types of recreation. These qualities, coupled with special wilderness features such as a high density of cultural sites, anadromous and warm water fish populations and unique vegetation communities, make the John Day River Canyon an area of outstanding natural qualities.

The area designated wilderness under this alternative would include all of the John Day River Canyon in the WSA, as well as most side canyons; it would also include the identified cultural resource sites and nearly all areas having outstanding wilderness qualities.

The 539 acres that would be recommended nonsuitable under the proposed action have few wilderness values. This area has no river frontage. In addition, this area is predominantly a north-facing slope overlooking Pine Hollow Canyon where a buried gas pipeline utility corridor is located. The gas line cannot be seen but the maintenance road and periodic vehicle travel on it reduce the naturalness of the area. Sights and sounds from a private ranching operation located within one-quarter mile of the WSA across the river in Thirtymile Canyon, adversely affect naturalness and solitude in this part of the WSA.

6. Summary and Analysis of Public Comments

Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analyses are addressed in the Statewide volume.

Comment: According to some maps, Section 36 is State land. If that is so, BLM should add it to the WSA by exchange. **Response:** Except for the 80 acres parcel located in the E[of the NE^ of Section 36 which is Federal surface/non-Federal mineral estate, all State grant land in this section passed into private ownership. The 80 acres of Federal Surface/non-Federal mineral estate land are included in the WSA.

Comment: Wilderness designation will impede recreational river travel and fishing. Wilderness management will "threaten" water quality. **Response:** Our analysis reveals a minor impact to recreation river travel by elimination of motorized boat use. Primary recreation use is for hunting and fishing by nonmotorized boats. There are no actions projected under wilderness management that will threaten water quality.

Comment: Map 3 in the Draft EIS shows 280 acres of private land - four tracts of 40 acres each and one tract of 120 acres. Yet BLM says only four tracts totaling 240 acres exist. **Response:** Two of the 40-acre private parcels "corner" on other private land and thus are considered as outside the WSA boundary.

Table 1. Summary of Proposed Management Under Each Alternative, North Pole Ridge WSA (OR-5-8)

Proposed Management	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	6,369	6,110	5,332	0
Acres Closed to ORVs by Wilderness Designationn[1]	6,369	6,110	5,332	0
Miles of Ways Closed	2.9	2.4	2	0
Miles of River Closed to Motorized Watercraft	6.2	6.2	6.2	0
Acres of Full Fee Estate acquired[2]	0	280	0	0
Acres of Mineral Estate acquired[3]	0	120	120	0
Energy/Mineral Actions				
Acres withdrawn from Mineral Location and Leasing by Wilderness Designation	6,249	5,990	5,212	0 4
Roads Constructed (miles)	0	0.3	0.3	0.3
Oil and Gas Pipelines (miles)	0	0.3	0.3	0.3
Drill Sites (number)	0	1	1	1
Non-structural Wildlife Projects Developed				
Brush Control w/o seeding (acres) (prescribed burning)	500	500	500	2,300
Structural Livestock Projects Developed				
Fence (riparian-miles)	0.5	0.5	0.5	0.5
Fence (management-miles)	0	0	0	2.6

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[1] Except for 2.9 miles of ways in the WSA, most of the acreage shown is already closed to cross-country vehicle use through an existing "limited" ORV designation.

[2] Upon acquisition from willing landowners, these additional lands would be incorporated into the wilderness area, closed to vehicle use and withdrawn from mineral location and leasing.

[3] Upon acquisition of the mineral estate, these lands would be withdrawn from energy/mineral location and leasing.

[4] Existing "no surface occupancy" stipulations currently protect all but 1,037 acres outside the river corridor's "seen" area from energy development.

Table 2. Summary of Environmental Consequences of Alternatives, North Pole Ridge WSA (OR-5-8)

Resource or Activity	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/No Action
Wilderness Values	Wilderness designation of 6,369 acres would protect and enhance existing wilderness values.	Wilderness designation of 6,110 acres with the acquisition of 120 acres of mineral estate would protect and enhance wilderness values. Wilderness values on approx. 200 acres of 539 acres recommended non- would be impaired by projected management actions, with further declines from other potential uses over the long term.	Wilderness designation of 5,332 acres with the acquisition of 120 acres of mineral estate would protect and enhance existing wilderness values. Wilderness values on approx. 200 acres of the 1,037 recommended non-suitable would be impaired by projected management actions,. with further declines from other potential uses over the long term.	Projected management actions would impair wilderness values on approximately 500 acres, with further declines from potential uses over the long term.
Energy and Mineral Development	Production from one projected oil and gas well would be foregone.	Production from one projected oil and gas well would occur.	Production from one projected oil and gas well would occur.	Production from one projected one oil and gas would occur.
Vegetation	The sagebrush-bunchgrass community on 500 acres burned would change to a primarily bunchgrass community. Riparian vegetation along 0.75 mile of John Day River would improve. 2.9 miles of ways would revegetate. Little or no change would occur to vegetation on the rest of the area.	The sagebrush-bunchgrass community on 500 acres burned would change to a primarily bunchgrass community. Riparian vegetation along 0.75 mile of John Day River would improve. 2.4 miles of ways would revegetate. Little or no change would occur to vegetation in the rest of the area.	The sagebrush-bunchgrass community on 500 acres burned would change to a primarily bunchgrass community. Riparian vegetation along 0.75 mile of the John Day River would improve. 2 miles of ways would revegetate. Little or no change would occur to vegetation on the rest of the area.	The sagebrush-bunchgrass community on 2,300 acres burned would change to a primarily bunchgrass community. 2,000 acres would change to mid-seral status through improved livestock management. Riparian vegetation along 0.75 mile of the John Day River would improve. Little or no change would occur to vegetation on the rest of the area.
Wildlife	Habitat and populations maintained. Riparian habitat improved along 0.75 mile of stream and 500 acres of upland habitat would be maintained.	Habitat and populations maintained. Riparian habitat improved along 0.75 mile of stream and 500 acres of upland habitat would be maintained.	Habitat and populations maintained. Riparian habitat improved along 0.75 mile of stream and 500 acres of upland habitat would be maintained.	Habitat and populations maintained. Riparian habitat improved along 0.75 mile of stream and 2,300 acres of upland habitat would be maintained.
Watershed	No impact.	No impact.	No impact.	Upland watershed improvement realized on 2,000 acres.
Livestock Grazing	Vehicle use precluded on 2.9 miles of ways.	Vehicle use precluded on 2.4 miles of ways.	Vehicle use precluded on 2 miles of ways.	Livestock distribution and management would improve.
Recreation Use	No impact.	No impact.	No impact.	No impact
Local Personal Income	Annual local personal income would remain at approximately $124,000.	Annual local personal income would remain at approximately $124,000.	Annual local personal income would remain at approximately $124,000.	Annual local personal income would remain at approximately $124,000.

Table 3. Classification of Energy and Mineral Potential, North Pole Ridge WSA (OR-5-8)

Commodity	Area	Level of Potential	Level of Certainty
Metals (gold/silver)	Entire WSA	M	C
Diatomite	Entire WSA	O	B
Limestone	Entire WSA	O	B
Zeolites	Entire WSA	O	B
Bentonite	Entire WSA	O	B
Uranium/Thorium	Entire WSA	O	B
Geothermal	Entire WSA	O	C
Oil/Gas	Entire WSA	M	C
Sodium/Potassium	Entire WSA	O	B
Coal	Entire WSA	O	B
Tar Sands/Oil Shale	Entire WSA	O	B
Sand and Gravel	Entire WSA	O	C
Crushable Rock	Entire WSA	L	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

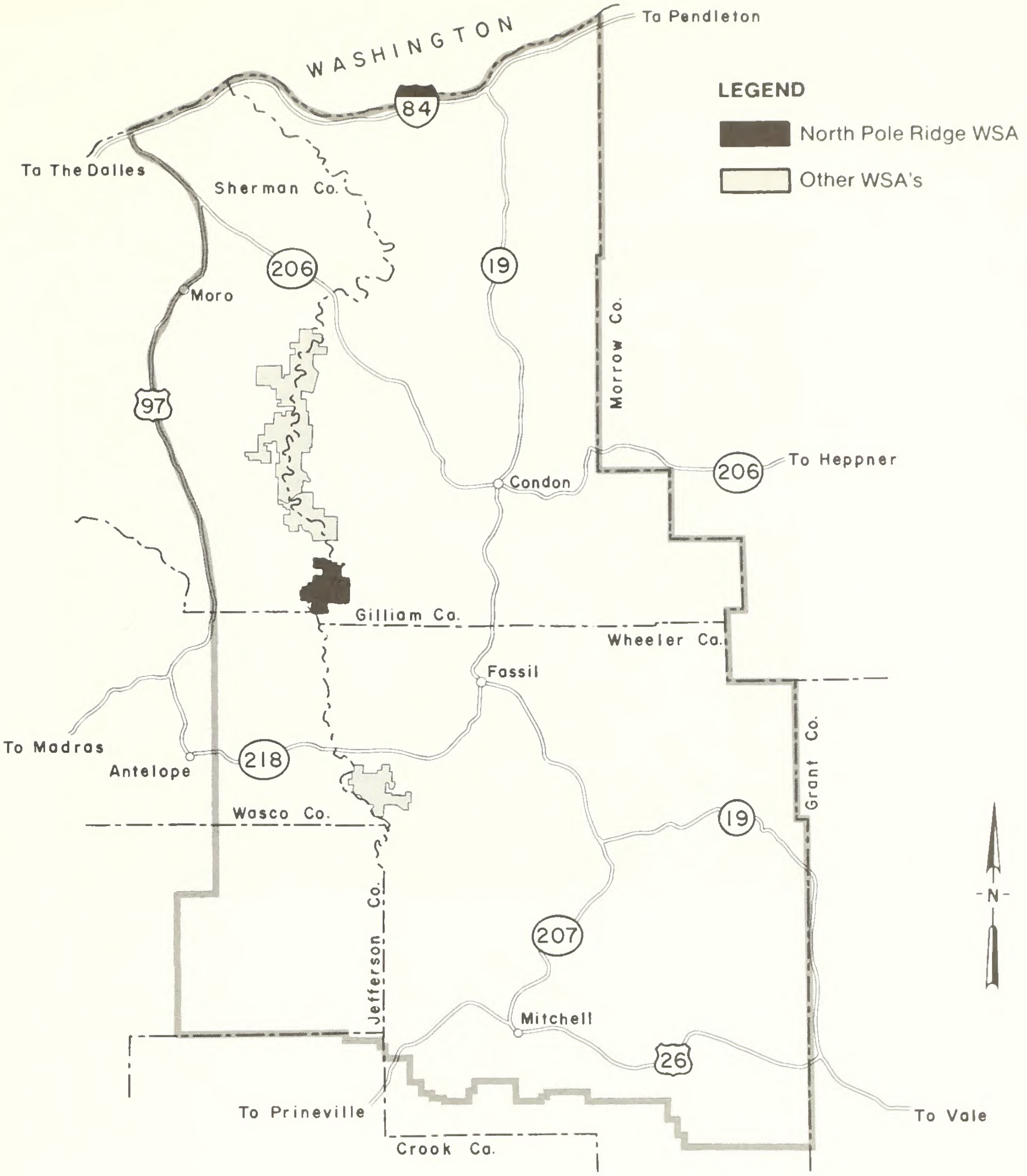
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

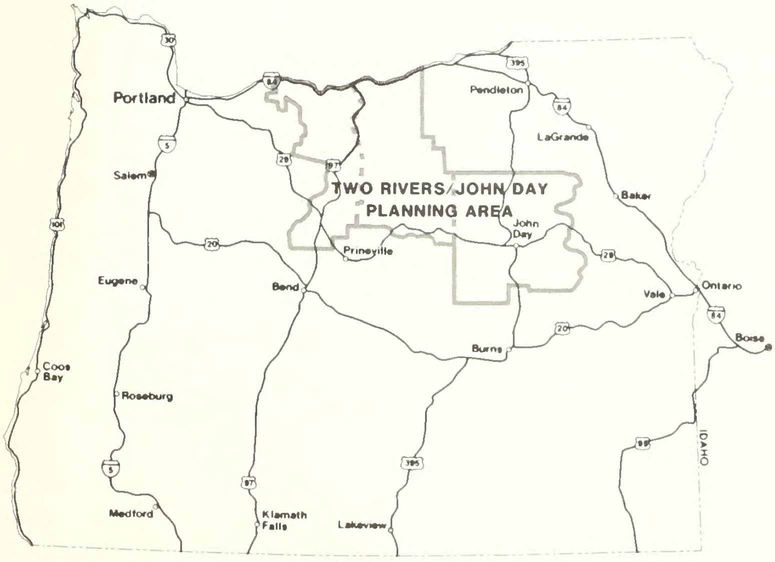
Table 4. Existing Livestock Use, North Pole Ridge WSA (OR-5-8)

Grazing Allotment	Licensed AUMs in Allotment	Period of use	Percent of Allotment in WSA	Current Estimated Use in WSA (AUMs)
Mauer (No. 2584)	526	03/01-02/28	6	30
Pine Creek (No. 2518)	346	04/16-11/17	58	199
Rattray (No. 2608)	312	08/15-0228	35	108
Totals	1,184			337

Table 5. Effects of Alternatives on Local Personal Income, North Pole Ridge WSA (OR-5-8) (1981 price levels)

Item	Unit of Measure	All Wilderness	Proposed Action	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Livestock Grazing	AUMs	No change	No change	No change	No change
Energy & Mineral Development:					
Oil & Gas Production Wells	Number	No change	+1	+1	+1
Recreation Use	RVD	No change	No change	No change	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES					
Livestock Grazing	$	No change	No change	No change	No change
Energy & Mineral Development:					
Oil & Gas Production Wells	$	No change	Unknown	Unknown	Unknown
Recreation Use	$	No change	No change	No change	No change
Total	$	No change	No change	No change	No change





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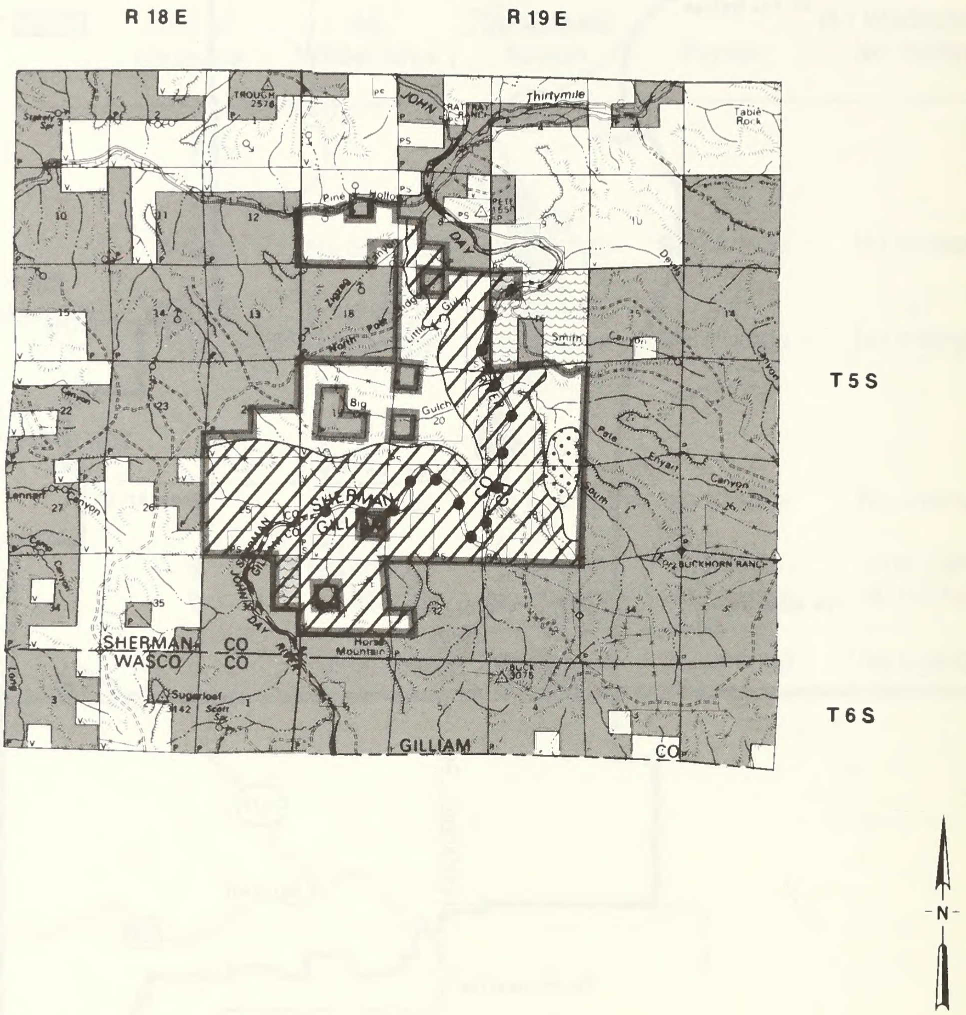
Prineville District

North Pole Ridge WSA
OR-5-8

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▨ BLM Land Studied Under Section 202 of FLPMA (Other BLM Land in WSA Studied Under Section 603 of FLPMA)

▬ **Wilderness Study Area Boundary**

☐ **Bureau of Land Management**

▩ **Private**

▤ **BLM Surface–State or Private Subsurface (Split Estate)**

● **Anadromous Fish Habitat**

▨ **Outstanding Scenic Values**

⁘ **Special Interest Plant Species**

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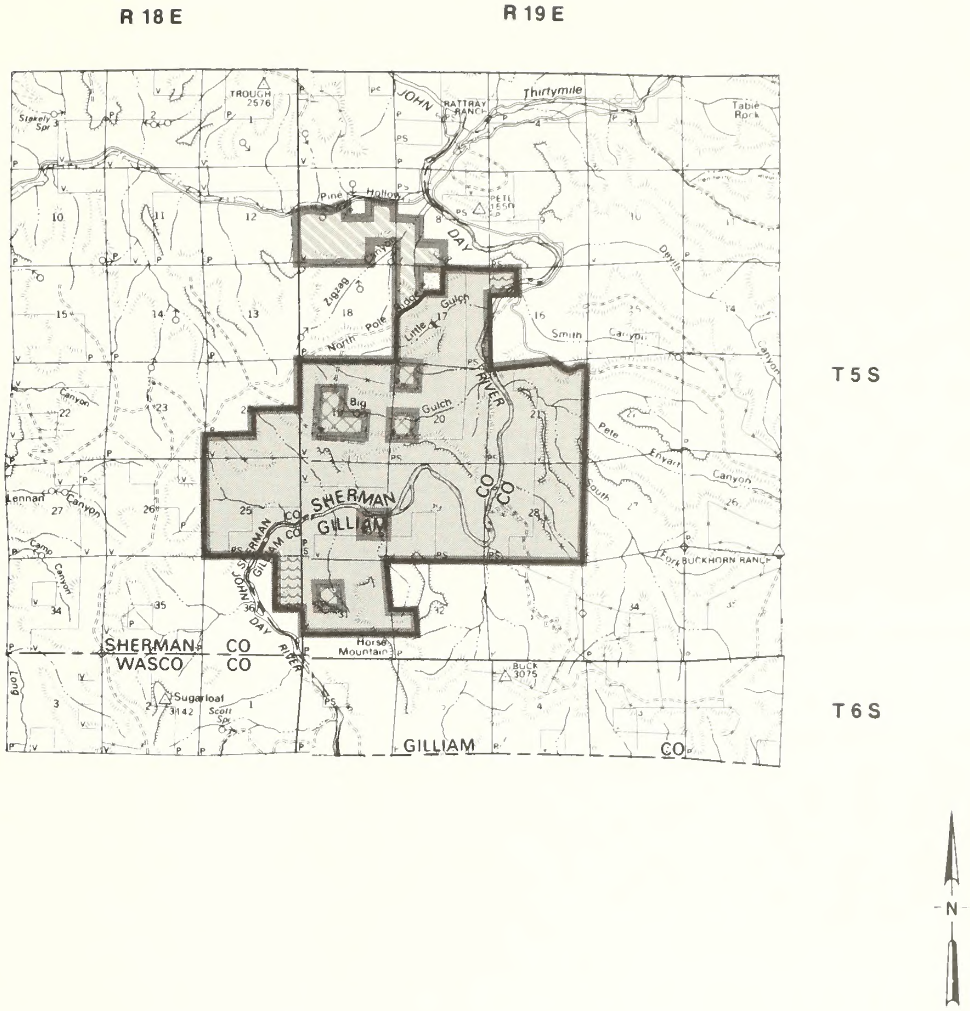
Prineville District

North Pole Ridge WSA
OR-5-8

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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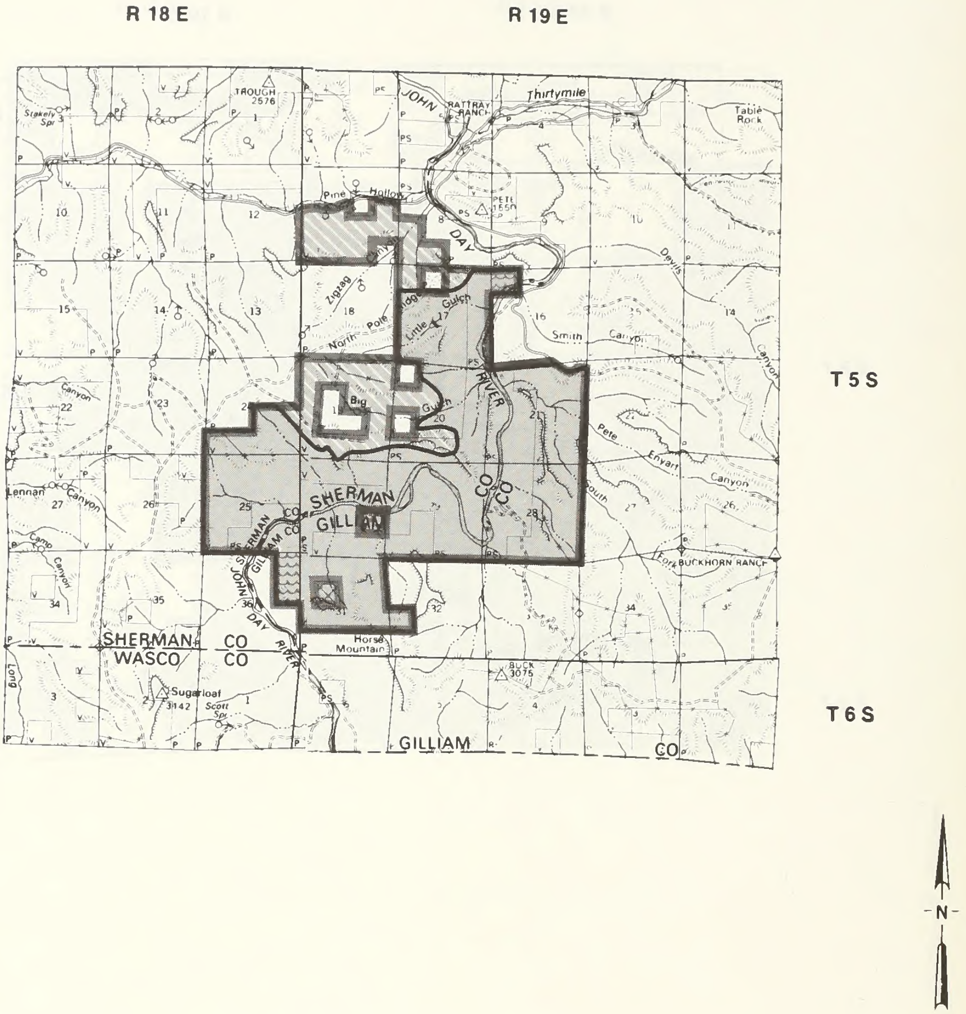
Prineville District

North Pole Ridge WSA
OR-5-8

PROPOSED ACTION

1 0 1 2 MILES

MAP 3



LEGEND

▬ Wilderness Study Area Boundary

▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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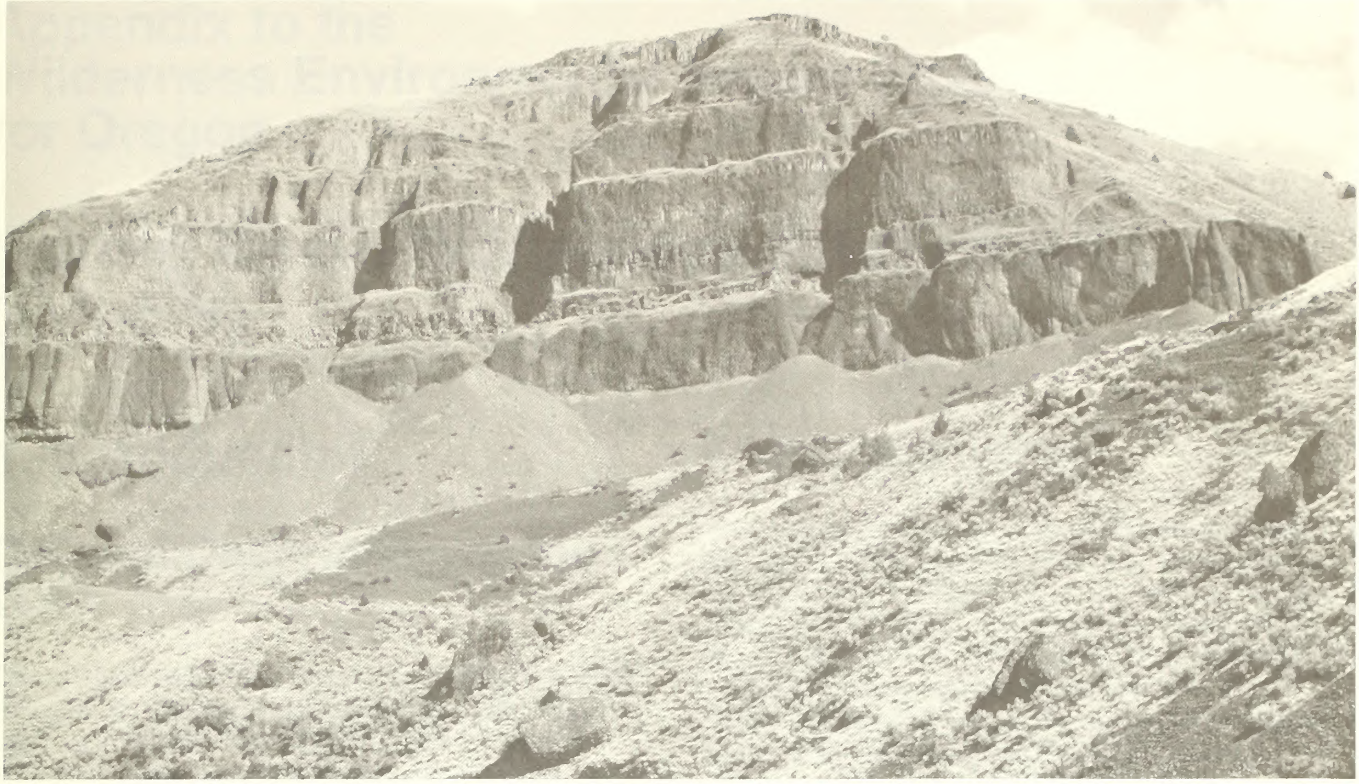
OR-5-8

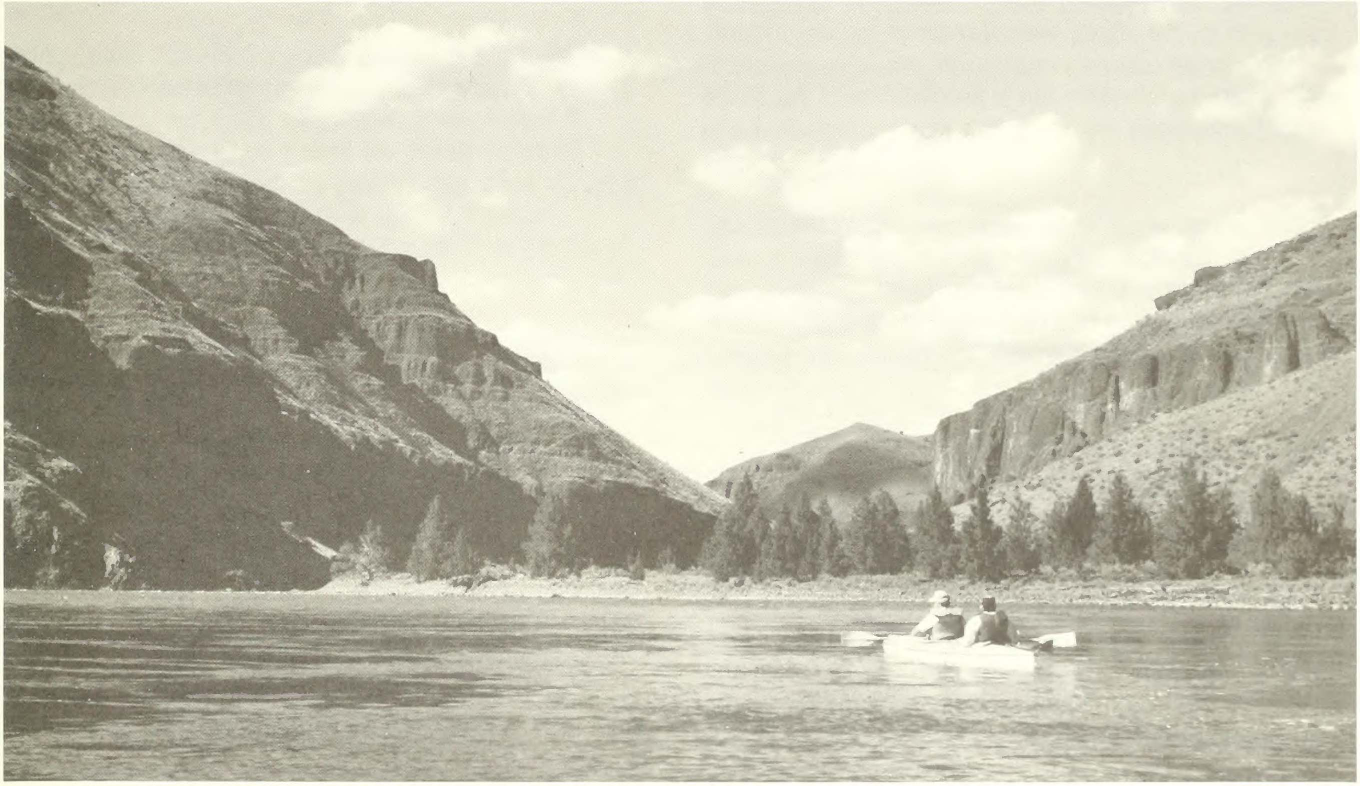
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4



North Pole Ridge WSA, OR-5-8. Looking east toward Basalt Rapids from the John Day River. Within area recommended suitable under the proposed action and partial alternatives. Typical scenery from the river. May 1981.



North Pole Ridge WSA, OR-5-8. Looking downstream (north) from river level toward Thirtymile Canyon. Within area recommended suitable under the proposed action and partial alternatives. May 1981.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Spring Basin Wilderness Study Area (OR-5-9)

1. Introduction

General Description of the WSA

Spring Basin Wilderness Study Area (WSA) is located between .25 mile and 1 mile east of the John Day River as it meanders through the Clarno Valley in Wheeler County (see Map 1). It is about 3 miles southeast of Clarno, Oregon and approximately 120 miles southeast of Portland. The northwest corner of the WSA is less than 1.5 miles from State Highway 218.

Spring Basin WSA is basically square in shape with small extensions at three corners (see Map 2). It is approximately 4.5 miles long north to south and 5 miles wide east to west. There are 5,982 acres of public land within the Spring Basin WSA. One 40-acre private inholding is located near the southwest boundary. The land surrounding the WSA is privately owned.

Spring Basin WSA has steep to rolling topography with sagebrush, western juniper and bunchgrass covered slopes. Near the river are basalt cliffs and escarpments. Three main drainages divide the study area, creating rugged side slopes. Horse Mountain and Black Rock offer views of portions of the WSA. There are also scenic vistas of the John Day River available from within the WSA.

The three drainages of the WSA flow toward the John Day River in a southerly and southwesterly direction. With the exception of a few isolated springs, no perennial water is found within the WSA.

The western and southern boundaries of the WSA are a combination of high standard gravel county roads, bladed and low standard dirt private roads and adjacent private land. The northern and eastern boundaries are formed by private land and a low standard dirt private road.

Interrelationships

A 147-mile stretch of the John Day River, including the segment near the WSA, has been designated a recreational river component of the National Wild and Scenic Rivers System. This same river segment is also an Oregon State Scenic Waterway, which provides some State control over private land use changes within 0.25 mile of the river which affects a small amount of land within the WSA.

A portion of the WSA near the John Day River is part of power site reserves and classifications which identify the land for potential water power and water storage development. These "withdrawals" are scheduled for review in the next few years, which may lead to their revocation. Power site development is not foreseen, and therefore is not discussed further. (See the Interrelationships section in the Statewide EIS volume.)

The entire WSA falls within lands ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. Under provisions of this treaty, Indians reserve the right to hunt, fish and gather in usual and accustomed places and graze livestock on unclaimed land.

The WSA is located within the Oregon Department of Fish and Wildlife (ODFW) Fossil Wildlife Unit, and supports approximately 100 mule deer. This present population level meets the ODFW management objective for mule deer in the WSA. The management objective for nongame wildlife is to maintain populations of naturally-occurring species at self-sustaining levels. Chukar partridge will also be managed at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife.

Wheeler County has not identified any conflicts between the proposed action and the county comprehensive plan.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on the area's wilderness values
- impact on grazing use levels and management
- impact on energy and mineral development
- impact on motorized recreation, and
- impact on threatened, endangered or sensitive plant species.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site condition and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness (proposed action)
- partial wilderness
- no wilderness/no action

An enhanced wilderness alternative is not analyzed because there is no feasible opportunity to significantly enhance wilderness values through road closures, acquisition of private inholdings, or addition of other tracts of public land.

All Wilderness (Proposed Action)

Under the all wilderness alternative, all 5,982 acres of public land in the Spring Basin WSA would be recommended suitable as wilderness (see Map 2). The boundary on the northern and eastern sides would be private land and a road. The boundary on the west and south would be a combination of private land and roads. For purposes of analysis, it is assumed the 40-acre private inholding would not be acquired and 9 miles of vehicle ways would be closed.

Energy and Mineral Development Actions

Wilderness designation would close 5,982 acres within the WSA to energy and mineral entry. A total of 1,500 acres within view of the John Day River is already protected by lease stipulations complementing its designation as an Oregon State Scenic Waterway which restricts oil and gas exploration and development to maintain visual quality within the river corridor. Surface disturbing exploration and development of oil and gas, metallic minerals and semiprecious stones, which all have a moderate potential for occurrence in the WSA, would be prohibited on the 5,982 acres. Exploration or development on the 40-acre private inholding is not expected to occur.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with guidelines established in BLM's Wilderness Management policy. The primary manner in which habitat would be managed to support existing wildlife populations would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Proposed projects include prescribed burning on 500 acres to maintain a fire-dependent ecosystem and to maintain wildlife habitat diversity. Wildfires that threaten life and/or property within the WSA would be fought aggressively. The 500-acre prescribed burn would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

Livestock use would remain at the present use level of approximately 89 AUMs in portions of five grazing allotments in the WSA. The period of use would remain as shown in Table 4. Approximately 8.75 miles of fence would be constructed along the eastern and northeastern boundaries of the WSA to prevent unauthorized livestock from entering this side of the WSA. This would maintain the upland vegetation in a predominantly late seral condition. Vehicle use for general livestock management and for inspection and maintenance of livestock projects would be precluded on 9 miles of ways. Livestock management and maintenance of 3.1 miles of fence and two spring developments would be conducted from horseback.

Recreation Management Actions

The entire 5,982 acres in the Spring Basin WSA would be closed to vehicle use. Vehicle use is presently limited through ORV designation to the 9 miles of existing ways; however, there isn't any public vehicle access to this area due to a locked gate at the end of the county road to the west. There is considerable private vehicle use on these ways from local landowners and their lessees and private hunting parties. All other public access is by foot or horseback from the county road. Current recreation use is estimated to be 8,000 visitor days per year. Most of the use is for rock collecting, hunting, sightseeing, and scientific study.

Partial Wilderness

Under the partial wilderness alternative, 5,299 acres of public land in the WSA would be recommended suitable for wilderness and 683 acres would be recommended nonsuitable (see Map 3). The area recommended suitable would surround the 40-acre private inholding. For purposes of analysis, it is assumed this parcel would not be acquired. A total of 8.2 miles of vehicle ways would be closed. The northern and eastern boundaries would consist of private land and a low standard dirt road. A combination of private land and the upland rim of the John Day River canyon would form the western boundary. Private land, a bladed high standard dirt road and a low standard dirt road would form the southern, southwestern and southeastern boundaries. The boundary between the suitable and nonsuitable areas would be a prominent canyon rim along the western boundary and the surveyed section line which approximately separates drainages in the northeast part of the WSA.

Energy and Mineral Development Actions

Wilderness designation would close 5,299 acres to energy and mineral entry. The 683 acres recommended nonsuitable would be open to energy and mineral entry, but since 403 acres of this nonsuitable area is protected by existing restrictive lease stipulations, oil and gas exploration and development is not projected. Exploration or development is not projected on the 40-acre private inholding.

Approximately 150 acres of a 2,315-acre area with moderate potential for gold and silver would be open to mineral entry. On these 150 acres it is projected that exploration would consist of further geochemical sampling; but due to the speculative nature of the occurrence and the small acreage available, no development is expected.

Of the 500 acres with moderate potential for semiprecious stones, 120 acres would be open for mineral entry. It is projected that exploration would continue but due to the speculative nature of the occurrence, no development is expected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with guidelines established in BLM's Wilderness Management Policy. The primary manner in which habitat would be managed to support existing wildlife populations would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Proposed projects include 500 acres of prescribed burning to maintain fire-dependent ecosystems and to maintain wildlife habitat diversity. Wildfires that threaten life and/or property within the WSA would be fought aggressively. The 500-acre prescribed burn would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

Livestock use would remain at the present use level of 89 AUMs in portions of five grazing allotments within the WSA. The season of use would remain as shown in Table 4. In the area recommended suitable, approximately 6.25 miles of fence would be constructed along the eastern and northeastern boundaries to prevent unauthorized livestock from entering this side of the WSA. Vehicle use for livestock management and for inspection and maintenance of livestock projects would be precluded on 8.2 miles of ways. Livestock management and the maintenance on 2.8 miles of fence and two spring developments would be conducted from horseback.

For the area recommended nonsuitable for wilderness, one spring would be developed and vehicle use for general livestock management and fence maintenance would be allowed on 0.8 miles of ways. The majority of livestock management and maintenance of range projects would be done from horseback.

Recreation Management Actions

In the area recommended suitable for wilderness designation, a total of 5,299 acres and 8.2 miles of ways would be closed to motorized vehicle use. At present, vehicle use is limited through ORV designation to existing ways as well as to the remaining 0.8 mile of way in the area recommended as nonsuitable. These ways are presently not available for public use due to a locked gate at the end of the county road to the west and most use is by adjacent landowners. Current recreation use is estimated to be 8,000 visitor days per year. Most of this use consists of rockhounding, hunting, sightseeing and nature study. Vehicle use would continue on the 0.8 mile of way within the 683 acres recommended nonsuitable for wilderness.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 5,982-acre WSA would be open to mineral entry. A total of 4,482 acres that are located outside the area currently protected by restrictive lease stipulations would be open to exploration and development for oil and gas.

A moderate potential for oil and gas would initially be explored by seismic surveys. Surface disturbance from the surveys would be negligible. Further exploration is projected to involve drilling one test exploration well which would require construction of a drill pad, pits and 1 mile of access road. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. Two additional wells would be anticipated which would require 1.5 miles of access roads. Approximately 2 miles of pipeline would be constructed in the WSA to market the gas. Total surface disturbance would be 12 acres.

Approximately 2,315 acres with moderate potential for metallic mineralization are located in the WSA. It is projected that exploration for these potential deposits would continue but would only entail further geochemical sampling with very limited surface disturbance. Due to the speculative nature of this occurrence, development is not expected.

Approximately 500 acres with moderate potential for semiprecious stones are located in the WSA. Due to the speculative nature of this occurrence, development is not expected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. The primary manner in which habitat would be managed to support existing wildlife populations would be through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Prescribed burning would be initiated on 2,300 acres to maximize wildlife diversity and maintain fire-dependent ecosystems. Wildfires that threaten life and/or property within the WSA would be fought aggressively. The 2,300-acre prescribed burn would replace those acres which will not be allowed to burn naturally.

Livestock Management Actions

An additional 200 AUMs of livestock forage currently available but unallocated would be allocated to livestock in the Spring Basin Allotment. This increase would involve 2,818 acres of the WSA plus the portions of the allotment extending outside the WSA. Grazing management would be changed from season-long use to deferred rotation in this allotment.

Three miles of fence would be constructed and three springs would be developed, all in the Spring Basin Allotment. The fence includes 1 mile of boundary fence needed to prevent livestock trespass and 2 miles of interior fence needed to implement management.

Vehicle use would continue on 9 miles of ways. The ways are now used 15 to 20 times per year to check livestock, spread salt and to maintain facilities, including 3.1 miles of fence and two spring developments.

Recreation Management Actions

Vehicle use would continue to be restricted to the existing 9 miles of ways although use would still be controlled by a private gate at the end of the county road. Current recreation use is estimated to be 8,000 visitor days per year for rockhounding, hunting, sightseeing and nature study. Use is increasing by five to ten percent per year. No recreation development is projected.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Most portions of the Spring Basin WSA appear to be in a natural condition and primarily affected by the forces of nature. Thirteen unnatural features within the WSA influence approximately 38 percent of the WSA (62 percent of the WSA is pristine, uninfluenced by any unnatural features). These features consist of 3.1 miles of fence, two spring developments and 9 miles of ways. Most of the ways are in the canyon bottoms or on ridgetops, and are screened from view except in their immediate vicinity. These features don't dominate the landscape due to topographic and vegetative screening, the size and shape of the WSA and their dispersal throughout the WSA.

Unnatural features outside the WSA that affect its naturalness include boundary roads and farmland aggregations consisting of houses, fences, corrals, outbuildings, roads, farm machinery, cultivated cropland and irrigation systems. However, they do not substantially affect the area's naturalness due to screening within the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Through topographic and vegetative screening, the Spring Basin WSA contains at least two areas where visitors can experience outstanding solitude. These two areas are located within the upper portions of Hay Bottom Canyon and between Eagle Canyon and Breo Flat. There are also several areas in Spring Basin, Hay Bottom and Eagle canyons where secluded spots are also available. However, these locations are generally small and are located on steep canyon slopes. Areas with limited topographic screening are located adjacent to the western and eastern boundary roads of the WSA.

Outside sights and sounds affecting the WSA's ability to provide solitude are evident from a portion of the WSA between the western boundary road and the prominent canyon rim above this road. Solitude opportunities are marginal in this area due to the outside sights and sounds of vehicle traffic and farming activities on adjacent lands.

A variety of primitive, unconfined recreational activities are available in the WSA. Opportunities for dayhiking, sightseeing, botanical study and photography of geologic formations are outstanding. Due to the rugged topography of the WSA, most of these recreation activities are confined to the canyon bottoms.

Special Features

Eagle Canyon contains a portion of the Clarno Formation. The rugged shape and colorful clay soils of this formation enhance the scenic quality and diversity within the WSA. The WSA is also part of a winter habitat area for the northern bald eagle which is Federally listed as threatened in Oregon (see Map 2).

Four plant species of special interest have been found within the WSA. (These plants are further discussed in the Vegetation section.)

One prehistoric cultural site, a pithouse village with associated pictographs, has been discovered within the WSA. Illegal excavation by artifact collectors is probably the greatest threat to its integrity. This site offers excellent opportunities for cultural resource studies.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler method of classifying ecosystems, the Spring Basin WSA is located within the Palouse Grassland Province and the potential natural vegetation is wheatgrass/bluegrass and sagebrush steppe with juniper. Of the vegetative communities listed in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan, the WSA contains the western juniper/big sagebrush/bluebunch wheatgrass, big sagebrush/bluebunch wheatgrass, and bluebunch wheatgrass/Sandberg's bluegrass communities.

There are six standard metropolitan statistical areas with populations over 100,000 within five hours' driving time of the Spring Basin WSA: Eugene/Springfield, Portland and Salem, Oregon; and Richland/Kennewick/Pasco, Seattle/Tacoma/Everett and Yakima, Washington.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical rock chip and stream sediment sampling. Technical details of the evaluation are found in a BLM report entitled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Spring Basin WSA." The WSA has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral potential classifications for the WSA. Map 4 shows where metals and semiprecious minerals have a moderate potential for occurrence within the WSA.

Exposed rocks in the WSA are Tertiary volcaniclastic sediments of the Clarno Formation. The subsurface rocks are inferred from oil and gas exploration wells to include Cretaceous marine clastic sediments and Pre-Cretaceous marine sediments and metamorphosed sediments.

Energy Resources

Oil and gas resources have a moderate potential for occurrence based on several positive factors. Several oil and gas exploration wells have been drilled north of the WSA and gas was recovered from one of them. In the same area there are three reported occurrences of asphalt. Farther north of the WSA, near Condon, a deep well had a slight oil show. The combination of surface and subsurface hydrocarbon shows, surface and subsurface geology, and history of oil and gas leasing all indicate a moderate potential for oil and gas in the entire WSA.

Current management restricts oil and gas exploration and development in the area seen from the John Day River by stipulating "no surface occupancy" on all leases. There are approximately 1,500 acres within the WSA presently covered by this restrictive lease stipulation.

As of October 16, 1987, no acreage within the WSA was leased for oil and gas and there were no geothermal leases in the WSA.

Mineral Resources

Geochemical analyses of stream sediment and rock chip samples show anomalous concentrations of zinc, lithium, mercury and molybdenum, and indicate a favorable geologic setting may exist for gold mineralization on 2,315 acres within the WSA. No deposits of strategic and critical minerals are known to exist in the WSA. As of October 16, 1987, one post-FLPMA mining claim, located after October 21, 1976, was filed on a portion of the WSA. No development is expected. Based on direct evidence, there is a moderate potential for the occurrence of semiprecious stones on 500 acres.

Vegetation

The predominant vegetation in the Spring Basin WSA is big sagebrush/bunchgrass and to a lesser extent juniper/bunchgrass. There is a scattering of rabbitbrush and low sagebrush communities. Associated grasses include bluebunch wheatgrass, needlegrass, Idaho fescue, Sandberg's bluegrass, sand dropseed and cheatgrass. Other plants common to the WSA include snakeweed, bitterbrush, lupine, locoweed and mountain mahogany.

The potential natural community (PNC) of the WSA is primarily bluebunch wheatgrass, including lesser amounts of big sagebrush, bluegrass and bitterbrush. At present, seral status of the vegetation varies from early seral to late seral, with few scattered PNC sites. Much of the WSA is in early seral stage due to a long history of overgrazing by cattle, sheep and horses. The vegetation consists of invader species such as snakeweed, cheatgrass and sagebrush, along with foxtail and annual fescue. This vegetation is typical in the drainages and on the gentler slopes where livestock have had easy access.

Further upslope, and in areas well away from water, the vegetation consists of a greater amount of PNC species such as bluebunch wheatgrass and bitterbrush. Some steep, northern exposures consist almost entirely of bunchgrass, often Idaho fescue.

Four plants of special interest were documented to occur within the WSA based on an inventory completed since the Draft Wilderness EIS was published. Two species, *Castilleja xanthotricha* (yellow-hairy Indian paintbrush) and *Astragalus diaphanus var. diaphanus* (transparent milk vetch) are Federal Candidates for listing under the Endangered Species Act. The other two, *Penstemon eriantherus var. argillosus* (fuzzytongue penstemon) and *Pediocactus simpsonii var. robustior* (hedgehog cactus) are of limited concern within Oregon according to the Oregon Natural Heritage Data Base. Off-road vehicle use, which is limited to existing roads and trails within the WSA, would be the only threat to any of these species. Horticultural collection of the Pediocactus has been known to occur from private lands in the general area, but does not appear to be a threat within the WSA.

Most of the WSA consists of a historically fire-dependent ecosystem. Frequent wildfires maintained the vegetation as predominately bunchgrass-dominated communities through removal of juniper and sagebrush. Through grazing practices which removed the grasses and forbs necessary to carry wildfire, and through modern day fire suppression, wildfire is no longer a common occurrence in the WSA.

Wildlife

A representative sampling of species occurring in this WSA includes mule deer, chukar, golden eagles, prairie falcons, bobcats, California quail, meadowlarks and mountain bluebirds. The northern bald eagle, listed as threatened in Oregon, is an occasional winter resident. A few springs occur in the WSA but there is little riparian habitat. Mule deer habitat is in fair condition and approximately 100 animals use the WSA yearlong.

Watershed

There are no perennial streams in the WSA. Year-round water is limited to a few springs.

Livestock Grazing

Portions of five grazing allotments lie within the WSA. Table 4 summarizes existing livestock use in AUMs. Use is generally season long. No grazing management systems have been implemented.

Existing livestock developments include 3.1 miles of fence and two spring developments.

The 9 miles of ways in the WSA are used primarily by livestock operators 15 to 20 times per year for general livestock supervision and for inspection and repair of existing livestock developments.

Recreation Use

Recreation use of the WSA includes rockhounding, hunting for upland gamebirds and deer, camping, sightseeing, photography, hiking and scientific studies associated with visitors from Camp Hancock and various environmental groups. Many large groups from Camp Hancock (a camp north of the WSA operated by the Oregon Museum of Science and Industry) and the Portland Audubon Society use the WSA for scientific study and observation of plants, animals and Indian culture. Public access is by foot or horseback from a county road which provides access to the west corner of the WSA. There is vehicle access to the area but it is controlled by a private gate. The recreation use level in the WSA is estimated to be 8,000 visitor days per year and is increasing by five to ten percent per year.

Local Personal Income

Livestock use at the current level of 89 AUMs and recreation use totalling 8,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $1,100 for livestock grazing and $96,000 related to recreation use of the WSA, for an overall total of $97,100. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness (Proposed Action)

Recommended suitable for wilderness: 5,982 acres

Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated as wilderness. Wilderness values within the entire 5,982 acres would be protected by legislative mandate. Wilderness values of naturalness, primitive and unconfined recreation and solitude would be preserved.

Special features including outstanding scenic quality, a winter habitat area for the northern bald eagle, cultural resource values and several plant species of special interest would also be protected.

Naturalness

The naturalness of the area's three canyons, Horse Mountain and associated valleys and plateaus would be enhanced by prohibiting vehicle use. Closure of 9 miles of ways within the WSA, influencing approximately 1,495 acres (25 percent of the WSA) would allow these ways to revegetate. The proposed 8.75 miles of boundary fence would likely be allowed because it would control and eliminate unauthorized livestock use from adjacent private lands and enhance natural values within the WSA. The fence, an unnatural feature, would influence approximately 900 acres within its immediate vicinity.

Prescribed burning of 500 acres would be noticeable in the short term. However, this treatment would eventually enhance naturalness through restoration of a fire-dependent ecosystem.

Solitude

Opportunities for solitude provided by the three prominent canyons, several side canyons and limited vehicle access would be further enhanced by eliminating motorized vehicle use on 9 miles of ways. This reduction in vehicle access would provide a core area for visitors to hike into and experience solitude without disturbance from vehicle use.

Primitive and Unconfined Recreation

Closure of 9 miles of ways to motorized vehicle use would increase opportunities for hiking, camping, photography, backpacking and other primitive and unconfined recreation activities. The quality of sightseeing, photography and birdwatching would also be improved by prohibiting vehicle use on these ways and allowing them to revegetate. A more natural and primitive setting would be provided, especially in Spring Basin Canyon where vehicle ways on the western canyon slope are very apparent.

Special Features

Impacts to special features would be reduced through prohibiting motorized vehicle use on 9 miles of ways. Impacts from vehicles, potential damage to plants of special concern and disturbance to wintering northern bald eagles would be eliminated. Reduced access to the cultural resource site would decrease vandalism.

Conclusion: Wilderness designation of the entire 5,982 acres within the Spring Basin WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 5,982 acres within the WSA to energy and mineral entry.

Energy Development

Exploration for oil and gas would be precluded on 5,982 acres. This is 4,482 acres more than is currently protected by restrictive lease stipulations. Projected development of three production wells would be precluded.

Conclusion: Production from three projected oil and gas wells would be foregone.

Mineral Development

The 2,315 acres with potential for metallic minerals, and the 500 acres with potential for semiprecious stones, would be closed to mineral entry. Surface disturbing exploration would be precluded. However, due to a lack of sufficient geologic evidence, no development is projected.

Conclusion: No impacts to metallic mineral or semiprecious stone development are expected.

Impacts on Vegetation

For the 500 acres treated by prescribed fire, the ecological status would rapidly change from mid-seral to late seral stage, or be maintained in late seral stage, and the residual ground cover would increase.

The elimination of unauthorized livestock use through construction of 8.75 miles of boundary fence would allow 500 acres of early seral status vegetation to change toward mid-seral status. Residual ground cover would increase throughout the WSA. Closure of 9 miles of ways would eliminate their disturbance on five acres and result in revegetation in two or three growing seasons.

Conclusion: Prescribed burning of 500 acres would change vegetation to late seral stage. Fence construction for control of livestock grazing would shift vegetation from early to mid-seral stage on an additional 500 acres. Nine miles of ways would revegetate.

Impacts on Wildlife

Wildlife habitat for approximately 100 mule deer and other wildlife species would be maintained under wilderness designation and through prescribed burning of 500 acres. Livestock allocation increases would not be allowed resulting in available forage above ODFW management goals. Closing 9 miles of ways would reduce disturbances to wildlife. Mule deer movement would be impeded by construction of the 8.75 miles of fence. Habitat quality would improve slightly due to improved livestock control.

Conclusion: Wildlife habitat and populations, including mule deer, would be maintained on 5,982 acres designated wilderness. ODFW management objectives would be met.

Impacts on Livestock Grazing

Livestock use would remain at the present use level of 89 AUMs and the present season of use would continue in portions of five allotments within the WSA. Wilderness designation of the entire WSA would preclude the allocation of 200 AUMs of currently available but unallocated forage in affected pastures, because of the potential adverse impacts upon the area's naturalness. (An additional allocation of 200 AUMs would cause greater utilization of existing vegetation resulting in a more grazed appearance, less residual ground cover and increased trampling.) Increases would not be allowed in pastures entirely or partially within the wilderness area. The construction of 8.75 miles of fence would eliminate the present unauthorized grazing on 500 acres and slightly decrease the level of utilization.

Vehicle use for livestock management and facility inspection and maintenance would be precluded on 9 miles of ways, resulting in slight inconvenience and additional expense to the livestock operators.

Conclusion: Livestock use would remain at the current level of 89 AUMs. A potential allocation of 200 AUMs of currently available but unallocated forage would be foregone. Additional inconvenience and expense to the livestock operators would result from the closure of 9 miles of ways to motorized vehicles.

Impacts on Recreation Use

Vehicular access would be precluded by the closure of 9 miles of ways. There would be some decrease in hunting use due to the lack of access. As awareness of wilderness qualities increase, greater visitation by wilderness users will offset losses attributable to the closure of ways. Overall, there would be a reduction in visitor use by 100 days per year in the short term and no change in the long term.

Conclusion: The area's recreation use level of 8,000 visitor days per year, which is increasing at an annual rate of five to ten percent, would decrease by 100 visitor days per year in the short term. Wilderness designation would eliminate the existing low level of motorized recreation. The existing primitive, non-motorized types of recreation uses would continue and in the long term, replace losses by motorized recreation.

Impacts on Local Personal Income

Livestock grazing would remain at 89 AUMs. Overall recreation use would decrease by 100 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $1,200 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $1,200.

Partial Wilderness

Recommended suitable for wilderness: 5,299 acres

Recommended nonsuitable for wilderness: 683 acres

Impacts on Wilderness Values

Wilderness values within the 5,299 acres designated as wilderness would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved.

The remaining 683 acres recommended nonsuitable for wilderness would not receive legislative protection. Wilderness values in this portion of the WSA would be vulnerable to the effects of other resource management actions, including continued vehicle use and livestock developments, including the construction of 6.25 miles of fence.

Naturalness

Within the 5,299 acres recommended suitable for wilderness, naturalness would be preserved. Closure of 8.2 miles of ways, which influence 1,362 acres (approximately 23 percent of the WSA), would allow the ways to revegetate and would enhance naturalness.

The proposed boundary fence would likely be allowed because it would control unauthorized livestock use within the WSA. As a result, naturalness would be enhanced. This fence, an unnatural feature, would visually influence approximately 643 acres (approximately 11 percent of the WSA).

For the 683 acres recommended nonsuitable for wilderness, vehicle use on 0.8 mile of ways would continue to impact naturalness on approximately 133 acres (approximately two percent of the WSA). The proposed livestock spring development would directly affect naturalness on one acre and visually influence 26 acres.

Solitude

Opportunities for solitude provided by topographic and vegetative screening qualities would remain in the 5,299 acres recommended suitable for wilderness. These opportunities would be further enhanced by eliminating motorized vehicle use on 8.2 miles of ways. This reduction in vehicle access would provide a larger area for visitors to hike into and experience solitude without disturbance from motorized vehicles.

In the area recommended nonsuitable for wilderness, vehicle use on 0.8 miles of ways and human activities associated with mineral exploration would impair opportunities for solitude adjacent to these activities.

Primitive and Unconfined Recreation

Within the 5,299-acre area recommended suitable for wilderness, closure of 8.2 miles of ways to motorized vehicle use would increase opportunities for primitive and unconfined recreation such as photography, horseback riding, hunting, nature study, backpacking and camping. By removing vehicles and allowing vehicle ways to revegetate, the quality of sightseeing, photography and nature study would increase.

Within the 683-acre area recommended nonsuitable for wilderness, vehicle use would continue to intrude on primitive, non-motorized recreation opportunities.

Special Features

In the area recommended suitable for wilderness, impacts to special features would be reduced through closing 8.2 miles of ways to motorized vehicle use. Impacts from vehicles, potential damage to plants of special concern and disturbance to wintering northern bald eagles would be eliminated. Reduced access to the cultural resource site would decrease vandalism.

In the area recommended nonsuitable for wilderness, continued vehicle use on 0.8 mile of ways would continue to affect scenic quality.

Conclusion: Wilderness designation of 5,299 acres would protect and enhance existing wilderness values. The 683-acre area recommended nonsuitable for wilderness would be impaired by continued vehicle use and livestock developments. Approximately three acres would be directly impacted and 160 acres would be visually influenced with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 5,299 acres to energy and mineral entry. The remaining 683 acres would be open for energy and mineral entry.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 5,299 acres by wilderness designation. This is 4,202 acres more than is currently protected by restrictive lease stipulations. Of the remaining 683 acres, 280 acres are outside of the restrictive lease stipulation area and would therefore be open to exploration and development. Projected development of three oil and gas wells would be precluded.

Conclusion: Production from three projected oil and gas wells would be foregone.

Mineral Development

Surface-disturbing exploration for metallic minerals would be precluded on 2,165 acres. Surface-disturbing exploration would also be precluded for semiprecious stones on 380 acres of the total 500 acres which have a moderate potential for occurrence of this resource.

In the area recommended nonsuitable for wilderness, 150 acres and 120 acres which have a moderate potential for the occurrence of metallic minerals and semiprecious stones, respectively, would be open for mineral exploration and development. Due to a lack of geologic evidence, no development is projected.

Conclusion: No impact to metallic mineral or semiprecious stone development is expected.

Impacts on Vegetation

For the 500 acres treated by prescribed fire, the ecological status would rapidly change from mid-seral to late seral stage, or be maintained in late seral stage, and the residual ground cover would increase.

The elimination of unauthorized livestock use through construction of 6.25 miles of boundary fence would allow 500 acres of early seral status vegetation to change toward mid-seral status. Residual ground cover would increase throughout this area. Closure of 8.2 miles of ways would eliminate their disturbance on four acres and result in revegetation in approximately two to three growing seasons.

In the area recommended nonsuitable for wilderness, vegetation would be disturbed on one acre from development of one livestock spring. There would be no other changes.

Conclusion: In the area recommended suitable for wilderness, prescribed burning of 500 acres would change vegetation to late seral stage. Fence construction would shift an additional 500 acres of early seral stage vegetation toward mid-seral stage in the long term. The 8.2 miles of ways that would be closed would revegetate, eliminating the unnatural influence on four acres. In the area recommended nonsuitable, one acre would be disturbed through the development of one spring.

Impacts on Wildlife Habitat

In the area recommended suitable for wilderness, wildlife habitat for approximately 95 mule deer and other wildlife species would be maintained under wilderness designation and through prescribed burning of 500 acres. The livestock allocation increase would not be allowed, resulting in available forage above ODFW management goals. Closing 8.2 miles of ways would reduce disturbances to wildlife. Construction of 6.25 miles of fence would slightly restrict mule deer movement and improve habitat by improving livestock control.

In the area recommended nonsuitable for wilderness, wildlife habitat for all species would be improved through the development of a spring which would ensure a continuous water supply. No other changes would occur. Habitat for five mule deer would be maintained.

Conclusion: Wildlife habitat would be slightly improved and ODFW management objectives would be met. Mule deer and other wildlife species would not be affected.

Impacts on Livestock Grazing

For the area recommended suitable for wilderness, livestock use would remain at the present use level of 73 AUMs in portions of five allotments. Wilderness designation would preclude the allocation of 200 AUMs of currently available but unallocated forage in affected pastures, because of the potential adverse impacts upon the area's naturalness. (An additional allocation of 200 AUMs would cause greater utilization of existing vegetation resulting in a more grazed appearance, less residual ground cover and increased trampling.)

Increases would not be allowed in pastures entirely or partially within the wilderness area. The construction of 6.25 miles of fence would eliminate the present unauthorized grazing on 500 acres and slightly decrease the level of utilization. It would increase the forage available for authorized livestock. Vehicle use for livestock management and facility inspection and maintenance would be precluded on 8.2 miles of ways, resulting in slight inconvenience and additional expense to the livestock operators.

In the area recommended nonsuitable for wilderness, livestock use would remain at the present level of 16 AUMs. One spring would be developed in the western portion which would improve livestock distribution and management. Vehicle use on 0.8 mile of ways would be allowed to maintain 0.3 miles of fence.

Conclusion: Livestock use would remain at the current level of 89 AUMs. A potential allocation of 200 AUMs of currently available but unallocated forage would be foregone. Slight inconvenience and expense to the livestock operator would result from the closure of 8.2 miles of ways to motorized vehicles. One spring development would improve livestock management.

Impacts on Recreation Use

In the area recommended suitable for wilderness, vehicular access would be precluded by the closure of 8.2 miles of ways. There would be some decrease in hunting use due to the lack of access. As awareness of wilderness qualities increase, greater visitation by wilderness users would offset losses attributable to the closure of ways. Overall, there would be a reduction in visitor use by 100 days per year in the short term and no change in the long term.

In the area recommended nonsuitable for wilderness, vehicle use would continue on 0.8 miles of ways. There would be no other impacts.

Conclusion: The area's recreation use level of 8,000 visitor days per year, which is increasing at an annual rate of five to ten percent, would experience a short-term decrease of 100 visitor days per year. Wilderness designation would result in a change to primitive, non-motorized types of recreation use.

Impacts on Local Personal Income

Livestock grazing would remain at 89 AUMs. Overall recreation use would decrease by 100 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $1,200 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $1,200.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres

Recommended nonsuitable for wilderness: 5,982 acres

Impacts on Wilderness Values

Under the no wilderness alternative, none of the 5,982 acres would be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation and the area's special features including outstanding scenery, winter habitat for the northern bald eagle, cultural resources and four plant species of special interest would be subject to the effects of projected management actions.

The projected actions include: mineral and energy exploration; the development of three oil and gas wells; construction of 3 miles of fence and three spring developments; vehicle use limited to existing ways for livestock management and facility inspection and maintenance; prescribed burning of 2,300 acres; and the allocation of 200 AUMs of currently available but unallocated livestock forage.

Naturalness

Vehicle use on the 9 miles of ways would continue to impact naturalness on approximately 1,495 acres (approximately 25 percent of the WSA). Most of this influence on the area's naturalness would occur within the central portion of the WSA. Energy or mineral exploration activities would cause minor short-term disturbance of the area's naturalness. Reclamation and natural revegetation would be required, leaving limited evidence of disturbance to naturalness. The projected development of three oil and gas wells, 2.5 miles of access road and 2 miles of pipeline would directly affect naturalness on 12 acres and visually influence 200 acres (four percent of the WSA). The construction of 3 miles of fence would control unauthorized livestock use in the WSA and allow for better management. The fence, an unnatural feature in itself, would directly affect six acres and visually influence approximately 300 acres (six percent of the WSA). Development of three springs would directly affect naturalness on two acres and would visually influence 50 acres. The allocation of an additional 200 AUMs would increase trampling around water sources and increase the utilization of forage, resulting in a more grazed appearance with a reduced amount of residual ground cover. However, prescribed burning of 2,300 acres (which would reduce naturalness in the short term), control of unauthorized livestock, and improved management through fence construction would eventually increase naturalness through an increase in residual ground cover. The prescribed burning would enhance naturalness by restoring the natural fire-dependent ecosystem.

Solitude

Continued vehicle use on 9 miles of ways, human activity associated with mineral or energy exploration and development, prescribed burning, and recreational activities using motorized vehicles would cause repeated but short-term impairment of solitude opportunities adjacent to these activities. Vehicle use predominately occurs in the canyon bottoms and ridges of the WSA. Solitude opportunities would be limited to the upper portion of Hay Bottom Canyon and between Eagle Canyon and Breo Flat where natural screening would allow a visitor to find a secluded spot.

Primitive and Unconfined Recreation

Vehicle use would continue to be limited to existing ways within this WSA. However, this use would continue to intrude upon primitive, non-motorized recreation opportunities in the vicinity of this activity.

Prescribed burning and construction of the 3 miles of fence and subsequent livestock control would improve primitive and unconfined recreation opportunities through the enhancement of the natural processes. These opportunities include photography, plant study, hunting and sightseeing.

Mineral and energy exploration and development and motorized recreation activities would continue to reduce primitive recreation opportunities by the presence of motorized vehicles. An additional livestock allocation of 200 AUMs would increase vegetation removal, trampling and fecal deposits in areas of livestock concentration.

Special Features

Continued vehicle use of existing ways would maintain the impacts on special features and the potential damage to plants of special concern in areas where unauthorized off-road vehicle use has occurred. The northern bald eagle would be disturbed by motorized vehicles. Vehicle access to the cultural resource site would continue which would leave it susceptible to illegal excavation and collection.

Conclusion: In the absence of wilderness designation, projected activities would both directly and indirectly impair wilderness values on 2,045 acres (34 percent of the acreage of the WSA) with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire WSA would be open to mineral entry, however 1,500 acres would still be protected by the restrictive lease stipulations for oil and gas.

Energy Development

Exploration and development for oil and gas would be allowed on the 4,482 acres that are not presently protected by restrictive stipulations. Based on favorable geologic conditions combined with evidence from nearby drilling, development of three oil and gas wells is projected.

Conclusion: Production from three projected oil and gas wells would occur.

Mineral Development

Mineral entry would be allowed within the WSA. Based on limited direct evidence for the occurrence of metallic minerals and semiprecious stones, casual exploration for these minerals would occur. A major exploration/development program is not anticipated.

Conclusion: Mineral development would not be affected.

Impacts on Vegetation

Bunchgrass communities on 2,300 acres in mid-seral to late seral stage would change to or be maintained in late seral stage through prescribed burning, and residual ground cover would increase.

Three miles of fence and three spring developments would be constructed which would eliminate unauthorized livestock use and allow the establishment of a grazing system and change in season of use. As a result, 1,000 acres in early seral stage would change to mid-seral status and residual ground cover would increase in all communities. This would more than offset any short-term decrease in residual ground cover resulting from the allocation of 200 AUMs of forage. Vegetation would be disturbed on two acres from spring developments and on 12 acres from energy developments.

Conclusion: Seral status of 2,300 acres would change to or be maintained in late seral status through prescribed burning. Seral status of 1,000 acres would change to mid-seral status through improved livestock grazing management. Vegetation would be disturbed on 14 acres through livestock and energy developments.

Impacts on Wildlife Habitat

Habitat for approximately 100 mule deer and other wildlife would improve through better livestock grazing management and prescribed burning. ODFW management goals for mule deer would be exceeded and the population would be expected to increase to 130 animals in the long term. Habitat diversity would also be increased by prescribed burning with approximately 40 percent of the WSA burned in a 50-year period. Disturbance to wildlife by mineral and energy activities and vehicle use would continue, although both are minor and restricted to the immediate vicinity of the activity.

Conclusion: Wildlife habitat would be enhanced through prescribed burning and improved livestock management. ODFW management goals would be exceeded and mule deer would increase. Minor disturbance to wildlife would occur from vehicle use and energy and mineral activities.

Impacts on Livestock Grazing

Presently available but unallocated forage would be allocated resulting in an increased forage allocation of 200 AUMs within the Spring Basin Allotment, for a total allocation of 289 AUMs within five allotments in the WSA.

Changes in season of use, the establishment of a grazing system and construction of 3 miles of fence would enhance livestock management. Vehicle use for livestock management and project inspection, maintenance and construction would continue on 9 miles of ways.

Conclusion: An additional allocation of 200 AUMs would be realized. Three springs would be developed. Livestock management and distribution would be improved.

Impacts on Recreation Use

Motorized recreation would continue on 9 miles of ways by those obtaining permission from the adjacent landowners to go through the locked gate and would be expected to increase slightly. Non-motorized recreation such as hiking, rockhounding and nature study would continue at present levels, although the natural setting for these opportunities would be disturbed by energy development that is projected to occur.

Conclusion: The area's overall recreation use level of 8,000 visitor days per year, which is increasing at an annual rate of five to ten percent, would not be affected.

Impacts on Local Personal Income

Livestock grazing would increase by 200 AUMs. Projected energy and mineral development would amount to three oil and gas production wells. Overall recreation use would remain at 8,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $2,400 per year plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $2,400.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (all wilderness), energy development (three wells) and mineral exploration and a 200-AUM increase in livestock forage allocation would be foregone. Vehicle use would be excluded, reducing opportunities for those who prefer this type of recreation by 100 visitor days per year. There would be a slight increase in livestock management costs as a result of the closure of the 9 miles of ways.

Relationship Between Short-Term Use and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, most existing short-term uses would continue, with some added minor inconvenience and expense to livestock operators resulting from the exclusion of vehicles for day-to-day inspection activities. The long-term productivity of the wilderness values would be preserved.

Irreversible and Irretrievable Commitment of Resources

Under the proposed action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The entire Spring Basin WSA would be manageable as wilderness. The 40-acre inholding of private land does not affect the area's manageability since it is used for livestock grazing. No changes in the use of the land are expected.

Rationale for Selection of the Proposed Action

The all wilderness alternative is the proposed action because of the wilderness values of the area, changes in conditions which have occurred since publication of the Draft EIS and strong public support for designation.

Until recently this area was the only large, accessible tract of public land in this locale which was available for vehicle-oriented recreation. However, the road which provided vehicle access to the WSA has been determined by the Wheeler County Court to not be a public road. As a result, vehicle access has been denied to the public. The outside sights and sounds from nearby Rajneeshpuram which had significantly reduced opportunities for solitude in much of the WSA are no longer a factor because the commune is no longer operational.

Finally, during the public comment periods of the draft and supplement to the draft Statewide wilderness EIS, strong public support for wilderness designation was expressed by a wide range of groups and individuals.

When the above factors were coupled with the wilderness values which exist in the area, it was determined that the value of the area for wilderness outweighed the value of the area for oil and gas development and an increase of 200 AUMs of livestock forage.

6. Summary and Analysis of Public Comments

The following is a summary of public comments and responses to those comments specific to this WSA. They deal with the adequacy of the analysis in this appendix. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analysis are addressed in the Statewide volume.

Comment: Are mining claims valid in this WSA and is there any development? **Response:** There are no known developments at this time. It is not known if the one claim is valid. The government has not determined validity of the claim and would not do so unless there is a demonstrated need for clear title.

Comment: There is inadequate vegetation data on *Pediocactus simpsonii* which grows in the area. **Response:** *Pediocactus simpsonii* var. *robustior* is common on rocky ridges and slopes within the WSA as it is within much of the John Day River drainage in this general area. The WSA has been inventoried for this species and locations have been mapped.

Comment: BPA is preparing an environmental analysis on relocating existing transmission lines. Will any lines affect Spring Basin? **Response:** Since Rajneeshpuram no longer exists, there is no demand to relocate and upgrade the existing transmission lines, and therefore a new environmental analysis has not been prepared by BPA.

Comment: The draft EIS underestimated recreation use by the Portland Audubon Society and from the OMSI Camp Hancock field trips. **Response:** These uses are now recognized and discussed in the Affected Environment section (Chapter 3, Recreation).

Table 1. Summary of Proposed Management Under Each Alternative, Spring Basin WSA (OR-5-9)

Proposed Management	All Wilderness	Partial Wilderness	No Wilderness/No Action
Acres Designated Wilderness	5,982	5,299	0
Acres Closed to ORVs by Wilderness Designation[1]	5,982	5,299	0
Miles of Ways Closed	9.0	8.2	0
Energy/Minerals Actions	5,982	5,299	0
Acres Withdrawn from Energy and Mineral Location and Leasing by Wilderness Designation			
Miles of Roads Constructed	0	0	2.5
Miles of Oil and Gas Pipelines	0	0	2
Number of Drill Sites	0	0	3
Nonstructural Wildlife Projects Developed			
Acres of Prescribed Burn	500	500	2,300
Structural Livestock Projects Developed			
Miles of Boundary Fences	8.75	6.25	1
Miles of Management Fences	0	0	2
Number of Springs	0	1	3
Additional Available Forage Allocated (AUMs)	0	0	200

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[1] Except for nine miles of ways in the WSA, the acreage shown is already closed to cross-country vehicle use through a "limited" ORV designation.

Table 2. Summary of Environmental Consequences of Alternatives, Spring Basin WSA (OR-5-9)

Resource or Activity	All Wilderness	Partial Wilderness	No Wilderness/No Action
Wilderness Values	Wilderness designation of 5,982 acres would protect and enhance existing wilderness values.	Wilderness designation of 5,299 acres would protect and enhance existing wilderness values. Wilderness values on 683 acres recommended nonsuitable would be impaired as a result of projected management actions.	Projected management actions would impair wilderness values on 2,045 acres with further declines from other potential uses over the long term.
Energy and Mineral Development	Projected production from three oil and gas wells would be foregone.	Projected production from three oil and gas wells would be foregone.	Projected production from three oil and gas wells would occur.
Vegetation	Seral status would move toward PNC on 1,000 acres. Nine miles (five acres) of ways would revegetate.	Seral status would move toward PNC on 1,000 acres. 8.2 miles (four acres) of ways would revegetate. One acre of vegetation would be disturbed by projected management actions.	Seral status would move toward PNC on 3,300 acres. Projected management actions would disturb 14 acres.
Wildlife	Wildlife habitat would be maintained. ODFW management objectives for mule deer would be met.	Wildlife habitat would be slightly improved. ODFW management objectives for mule deer would be met.	Wildlife habitat would be moderately improved. ODFW management objectives for mule deer would be exceeded. Minor disturbance to wildlife would continue.
Livestock Grazing	200 AUMs of currently available but unallocated forage would be foregone. Vehicle use on nine miles of ways would be precluded resulting in slight inconvenience and cost to the livestock operators.	200 AUMs of currently available but unallocated forage would be foregone. Vehicle use on 8.2 miles of ways would be precluded resulting in slight inconvenience and cost to to the livestock operators. Management would improve through one spring development.	200 AUMs of currently available but unallocated forage would be allocated. Management would improve through fence and spring developments.
Recreation Use	Motorized recreation would be eliminated. The areas overall recreation use would slightly decrease in the short term. No change in long term.	Motorized recreation use would be eliminated from most of the WSA. The areas overall recreation use would slightly decrease in the short term. No change in long term.	There would be no change in the level or type of existing use.
Local Personal Income	Annual local personal income would decrease by approximately $1,200.	Annual local personal income would decrease by approximately $1,200.	Annual local personal income would increase by approximately $2,400.

Table 3. Classification of Energy and Mineral Potential, Spring Basin WSA (OR-5-9)

Commodity	Area	Level of Potential	Level of Certainty
Metals	See Map 4	M	C
Diatomite	All of WSA	L	C
Limestone	All of WSA	L	C
Zeolites	All of WSA	L	C
Bentonite	All of WSA	L	C
Semiprecious	See Map 4	M	C
	Rest of WSA	L	B
Uranium/Thorium	All of WSA	O	B
Geothermal	All of WSA	O	C
Oil/Gas	All of WSA	M	C
Sodium/Potassium	All of WSA	L	B
Coal	All of WSA	O	B
Tar Sands/Oil Shale	All of WSA	O	B
Sand and Gravel	All of WSA	L	C
Crushable Rock	All of WSA	L	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainity

A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

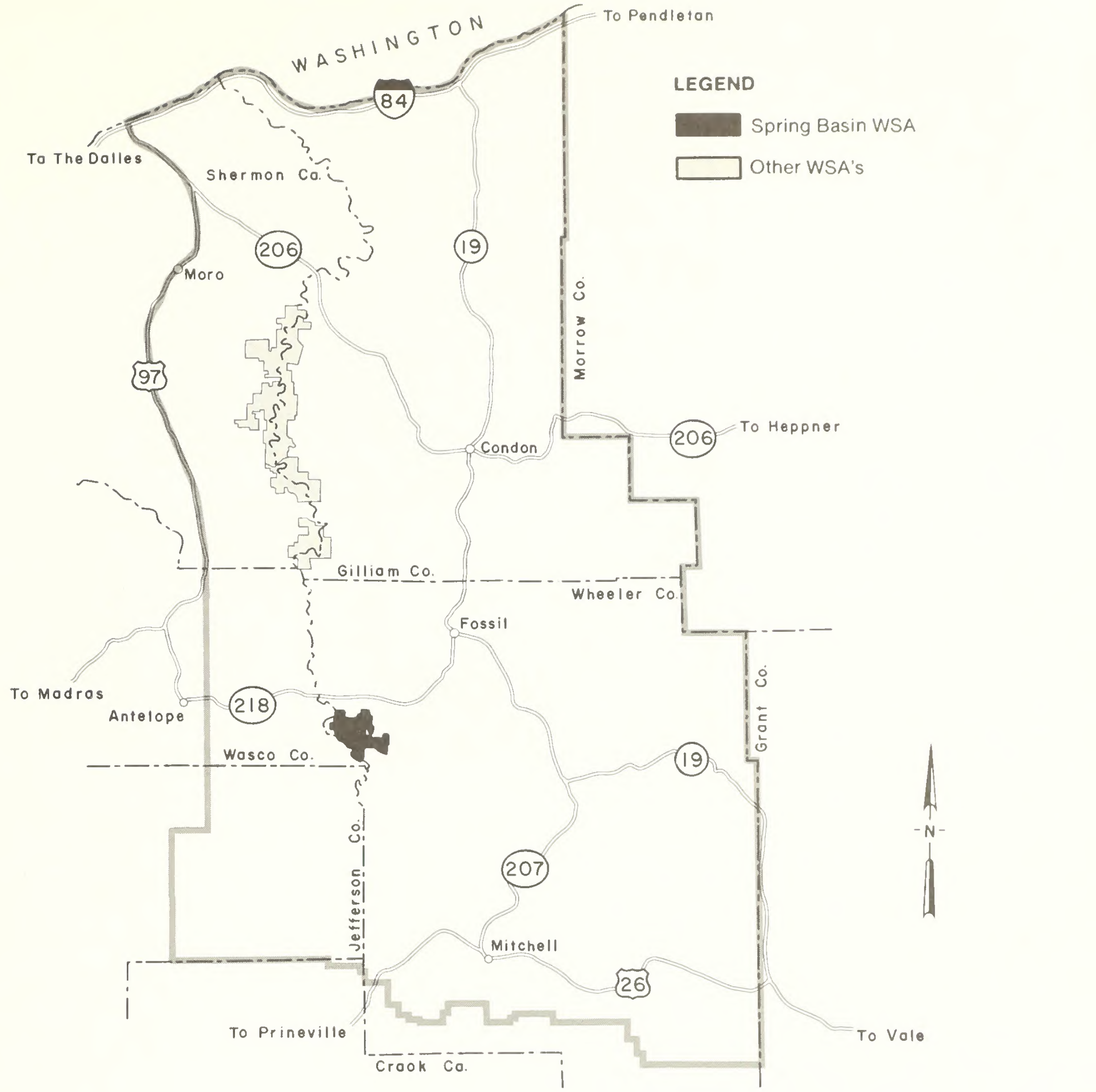
Table 4. Existing Livestock Use, Spring Basin WSA (OR-5-9)

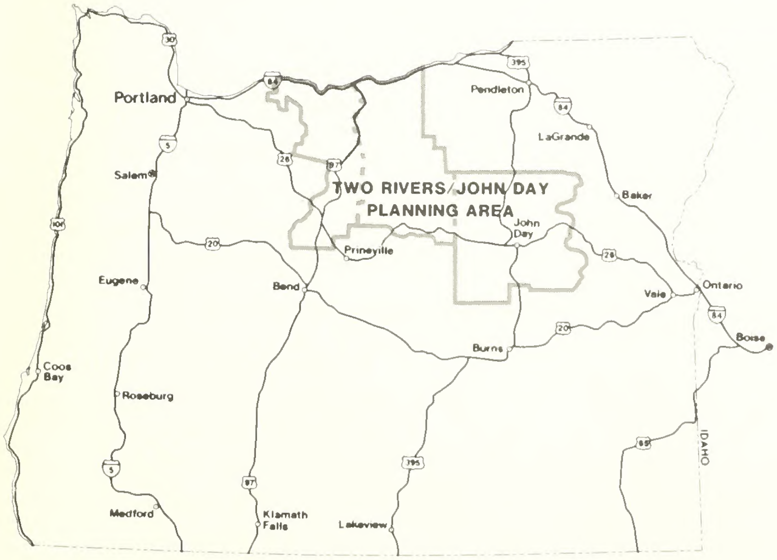
Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allotment in WSA (AUMs)	Current Annual Use in WSA (AUMs)
Hayfield (No. 2535)	11	10/01-12/21	27	3
Dry Knob (No. 2656)	7	04/01-10/31	100	7
Rim (No. 2649	3	05/01-07/31	33	1
Rolfe (No. 2615)	4	08/10-10/09	25	1
Spring Basin (No. 2536)	142	04/01-11/14	54	77[1]
Total	167			89

[1] Draft EIS in error. Spring Basin Allotment has 77 AUMs inside WSA.

Table 5. Effects of Alternatives on Local Personal Income, Spring Basin WSA (OR-5-9) (1981 price levels)

Item	Unit of Measure	All Wilderness (Proposed Action)	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	No change	+200
Energy & Mineral Development:				
Oil & Gas Production Wells	Number	No change	No change	+3
Recreation Use	RVD	-100	-100	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	No change	No change	+2,400
Energy & Mineral Development:				
Oil & Gas Production Wells	$	No change	No change	Unknown
Recreation Use	$	-1,200	-1,200	No change
Total	$	-1,200	-1,200	+2,400





U. S. Department of the Interior
Bureau of Land Management

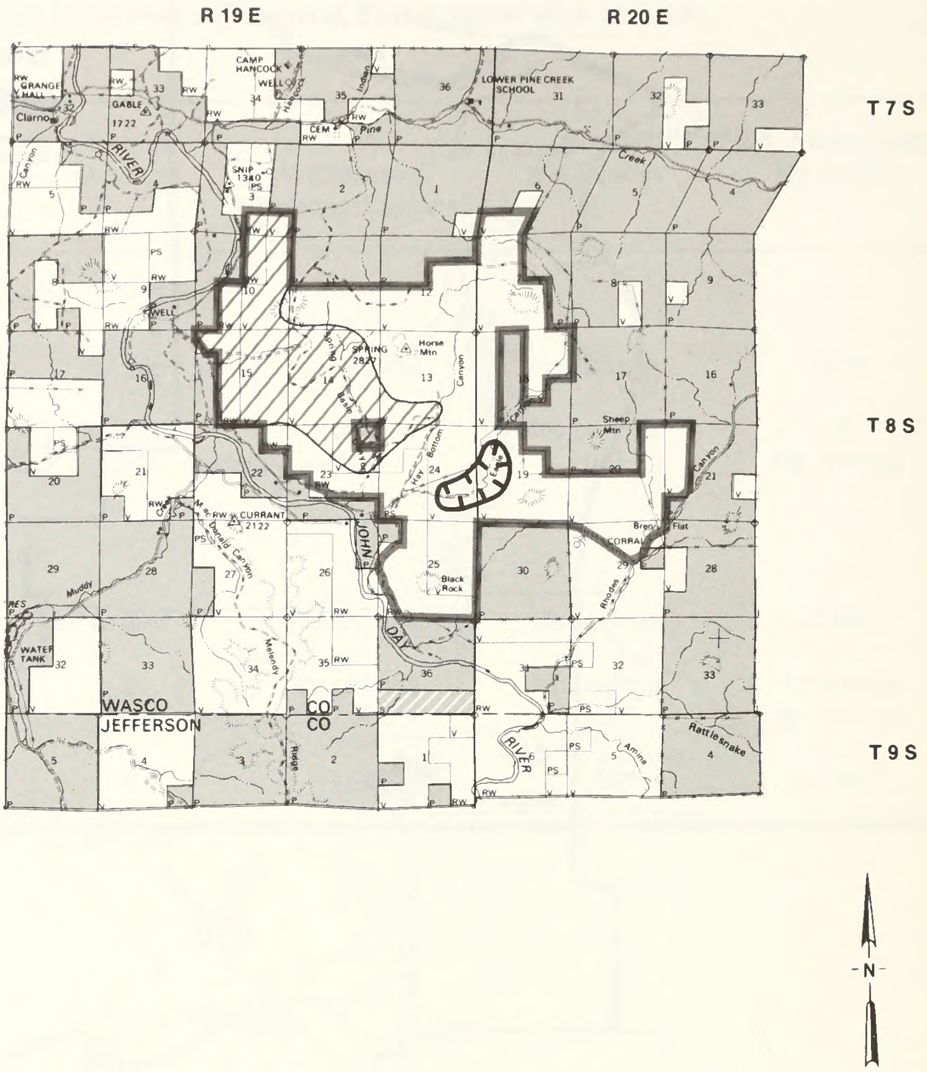
Prineville District

Spring Basin WSA
OR-5-9

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

■ Private

▧ Special Interest Plant Species

○ Scenic / Geologic Formation

Entire Area is Northern Bald Eagle Habitat

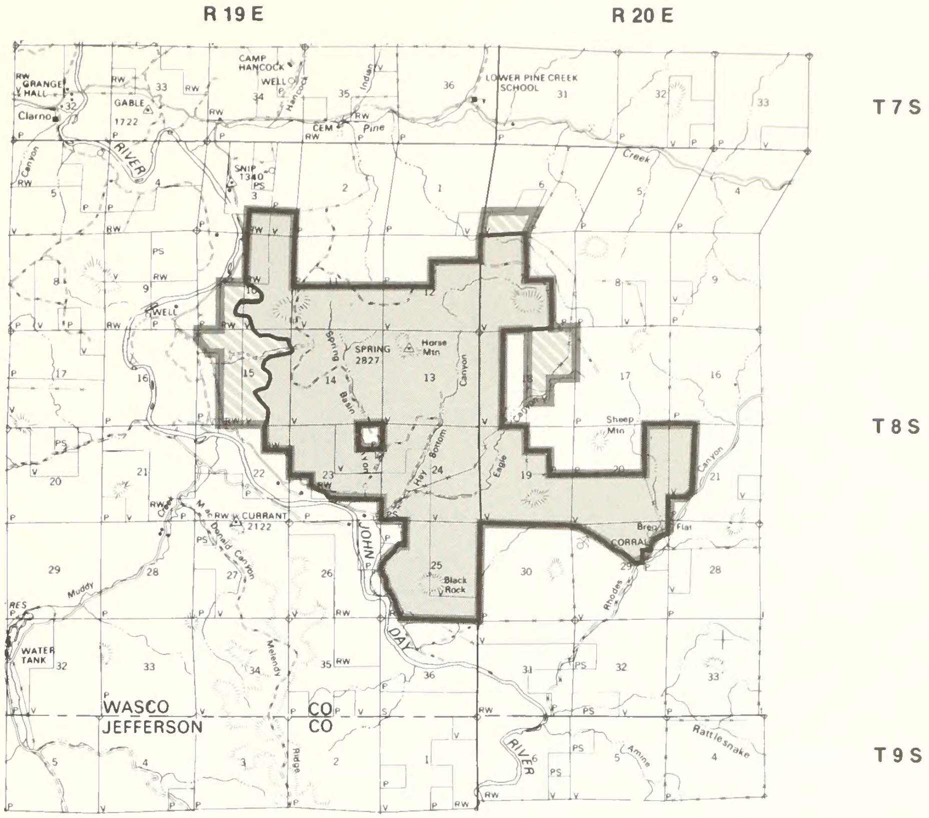
U. S. Department of the Interior
Bureau of Land Management
Prineville District

Spring Basin WSA
OR-5-9

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

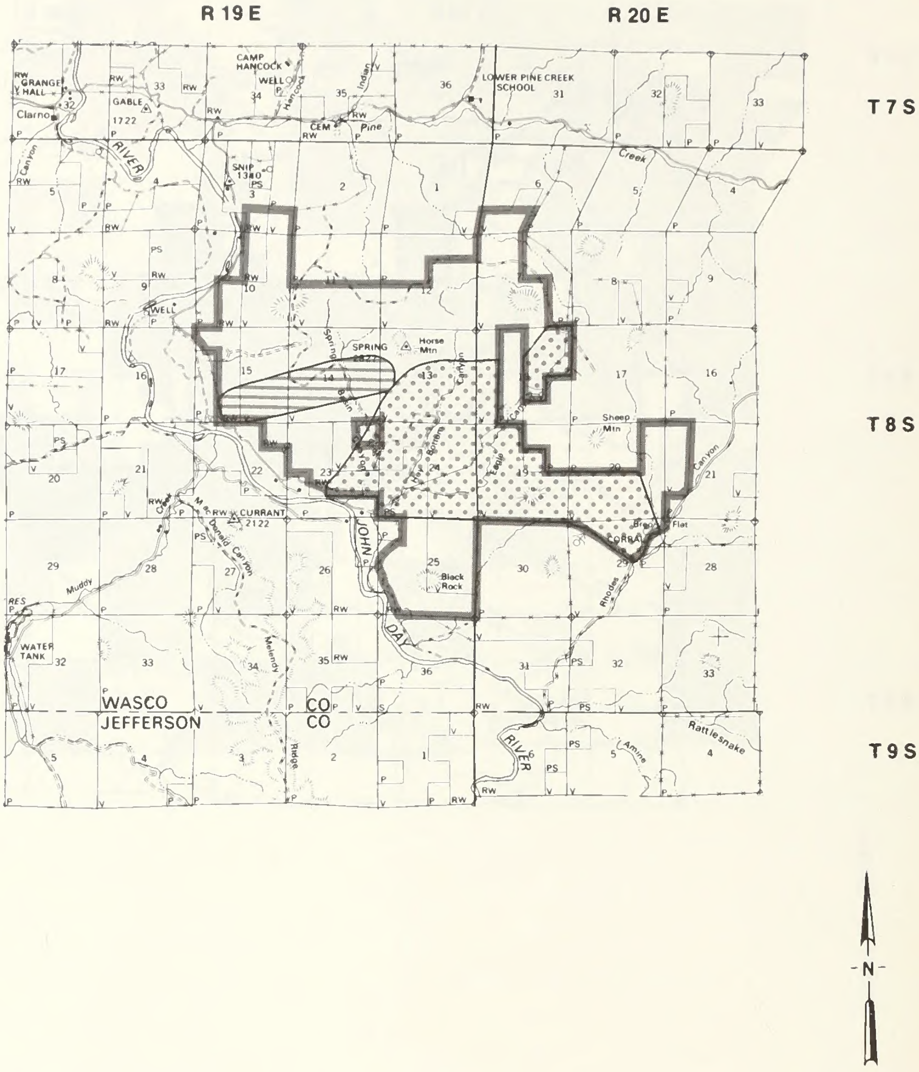
U. S. Department of the Interior
Bureau of Land Management
Prineville District

Spring Basin WSA
OR-5-9

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



▒ **Moderate Potential**
(MC) for Zinc, Mercury, Lithium
and Molybdenum

▤ **Moderate Potential**
(MC) for Semiprecious Stones

Entire WSA:
Moderate Potential
(MC) for Oil and Gas

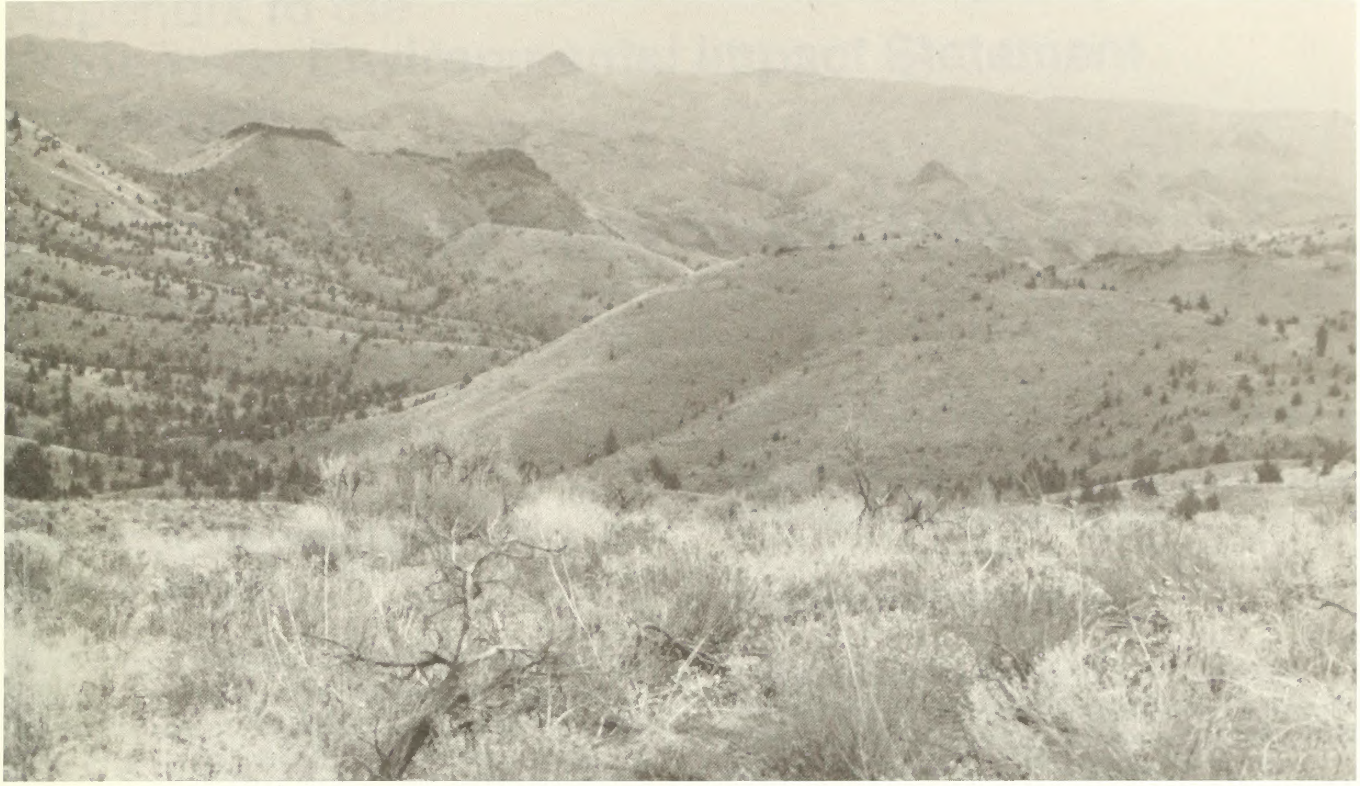
U. S. Department of the Interior
Bureau of Land Management
Prineville District

Spring Basin WSA
OR-5-9

MODERATE OR HIGH POTENTIAL
MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



Spring Basin WSA, OR-5-9. Looking south from the northern portion of the WSA. Within area recommended suitable under the proposed action and partial alternative and nonsuitable under the no wilderness action alternative. Typical scenery of the northern portion of the WSA. September 1979.

Spring Basin WSA, OR-5-9. Looking north toward Horse Mountain in the central portion of the WSA. Within area recommended suitable under the proposed action and partial alternatives and nonsuitable under the no wilderness/no action alternative. Horse Mountain is a prominent geologic feature in the WSA. September 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Badlands Wilderness Study Area (OR-5-21)

1. Introduction

General Description of Study Area

The Badlands Wilderness Study Area (WSA) is located in Deschutes and Crook counties, approximately 25 miles east of Bend, Oregon, and about 150 miles southeast of Portland, Oregon (see Map 1). The nearest highway is U.S. Highway 20 which forms the southern and southwestern boundary of the WSA.

The WSA contains 32,221 acres of public land. There is a 40-acre inholding of private land located near the northeastern boundary (see Map 2).

The Badlands WSA is relatively rectangular in shape. It is characterized by rolling hills and basalt escarpments with jagged outcroppings. Adjacent land is mostly public, except for private land to the north and the south.

The western and southern boundaries are formed by a combination of private property, U.S. Highway 20 and a BLM-maintained low standard bladed dirt road. The northern boundary is formed by a canal and private land. A powerline and low standard bladed dirt road forms the eastern boundary.

There is a wide diversity of basalt flow formations within the study area. Sand blown into the area covers many small, irregularly shaped volcanic basins and valleys. Much of the area is covered by western juniper with an understory composed of bitterbrush and bunchgrass.

Reynolds Pond and a small unnamed pond in the northwest portion of the WSA are the only surface water. Reynolds Pond is part of the Central Oregon Irrigation Canal System. Both ponds are fed by the irrigation canal forming the northwestern boundary of the WSA. Water levels in the ponds are dependent on flows in the canal and consequently fluctuate widely. When full, Reynolds Pond covers eight surface acres and the small pond less than one acre.

Interrelationships

A primary canal, operated by the Central Oregon Irrigation District and providing irrigation water to agricultural lands to the north, is adjacent to the Badlands WSA and forms about 3 miles of the northwest boundary. The canal itself does not have an impact on the study area. However, the operation and maintenance activities associated with this irrigation system affect the amount of surface water and the type and amount of hunting and fishing recreation in the area.

Approximately the northern third of the study area falls within lands which were ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. This treaty reserved to the Indians rights for hunting, fishing and gathering in usual and accustomed places and for grazing livestock on unclaimed land.

This WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) Paulina Wildlife Unit. The WSA supports approximately 65 mule deer and ten antelope yearlong. At present, antelope are at their management objective level but mule deer are proposed to be increased by 20 percent. The management objective for nongame species is to maintain populations of naturally occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

Crook and Deschutes Counties have not identified any conflicts between the proposed action and the county comprehensive plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review processes. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on the area's wilderness values, including outstanding opportunities for solitude and primitive recreation and special features;
- impact on grazing use levels and management;
- impact on wood products harvest;
- impact on mule deer and other wildlife; and
- impact on mineral development.

Concerns raised by the public related to impacts on geothermal and oil and gas development were not addressed as issues since the potential for both of these mineral resources is low. Off-road vehicle use in the designated Millican Valley off-road vehicle area was identified as an issue but was not addressed because the Brothers/LaPine Resource Management Plan has since changed the designated ORV area so it no longer overlaps portions of the WSA.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness
- proposed action
- partial wilderness
- no wilderness/no action

An enhanced wilderness alternative is not analyzed because there is no feasible opportunity to significantly enhance wilderness values through additional road closures, acquisition of private inholdings or additions of other tracts of public land.

All Wilderness

Under the all wilderness alternative, all 32,221 acres of public land in the Badlands WSA would be recommended suitable as wilderness (see Map 2). The boundary on all sides would be a combination of private land and low standard bladed dirt roads with U.S. Highway 20 forming a portion of the southwest boundary. For purposes of analysis, it is assumed that the 40-acre private inholding would remain in private ownership. A total of 58.1 miles of ways would be closed to motor vehicles.

Energy and Mineral Development Actions

Wilderness designation would close 32,221 acres within the WSA to energy and mineral entry. Surface-disturbing exploration and development of sand and gravel, which have a moderate potential for occurrence on 3,010 acres, would be prohibited.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM Wilderness Management Policy. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the present level of 1,100 AUMs within all of one grazing allotment and portions of six other allotments. The season of use would remain as shown in Table 4. No additional livestock management facilities would be constructed and no juniper or sagebrush control practiced within the area. Day-to-day management of livestock and maintenance of 23.6 miles of fence would be done primarily by horseback. While 58.1 miles of ways would be closed, 15 miles of the ways would be used to haul water to livestock. This would be done approximately three times per week during either the spring, summer, or fall grazing season and would be done by truck. Approximately one mile of way would be used by heavy equipment, under permit, once every 10 to 15 years to maintain two reservoirs.

Wood Products Harvest Actions

Wilderness designation would close 32,221 acres within the WSA to wood products harvest.

Recreation Management Actions

The entire 32,221 acres in Badlands WSA would be closed to vehicle-oriented recreation. This would include closing 58.1 miles of ways to motorized vehicle use. At present, vehicle use is limited to the ways within the WSA. Current recreation use is estimated to be 10,000 visitor days per year and occurs year-round.

Proposed Action

Under the proposed action, 32,030 acres of public land in the WSA would be recommended suitable as wilderness and 191 acres would be recommended as nonsuitable (see Map 3). A total of 57.7 miles of ways would be closed. The area recommended suitable would include the 40-acre private inholding. For purposes of analysis, it is assumed this parcel would be acquired through purchase or exchange with willing landowners. The area would then total 32,070 acres. The boundary on the east and south would be a combination of private land and low standard bladed dirt roads with U.S. Highway 20 forming a portion of the southwest boundary. The west and northwest boundary would be a combination of private land, a low standard bladed dirt road, the line between two fingers of public land and the fence around Reynolds Pond.

Energy and Mineral Development Actions

Wilderness designation would close 32,070 acres within the WSA to energy and mineral entry. Surface-disturbing exploration and development of sand and gravel, which have a moderate potential for occurring on 3,010 acres, would be prohibited. A total of 191 acres would be open to energy and mineral entry. Due to the low potential of this area for energy or mineral resources, no development is anticipated.

Wildlife Habitat Management Actions

Habitat in the suitable portion would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM Wilderness Management Policy. In the portion recommended as nonsuitable, habitat would be managed in accordance with ODFW management goals. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the present level of approximately 1,100 AUMs. The season of use would remain as shown in Table 4. In the portion recommended suitable for wilderness, no additional livestock management facilities would be constructed and no juniper or sagebrush control would be practiced within the area. Day-to-day management of livestock and maintenance of 23.2 miles of interior fence would be done primarily by horseback. While 57.7 miles of ways would be closed, 15 miles of these ways would continue to be used to haul water to livestock. This would be done approximately three times per week during either the spring, summer or fall grazing season using a truck.

In the area recommended nonsuitable for wilderness, no livestock management facilities would be constructed and no juniper or sagebrush control would be practiced within the area. Approximately 0.4 mile of way would continue to be used by motor vehicles for access to maintain 0.4 mile of fence.

Wood Products Harvest Actions

Wilderness designation would close 32,070 acres within the WSA to wood harvest. A total of 191 acres would be available for wood harvest but no harvest is anticipated.

Recreation Management Actions

Under this alternative, 32,070 acres recommended suitable for wilderness designation including 57.7 miles of ways would be closed to motorized vehicle use. Current recreation use of this area is estimated to be 10,000 visitor days per year for sightseeing, target practice, hiking, hunting and photography. Recreational ORV use occurs on existing ways. The existing vehicle use is limited to existing ways through vehicle designation. A total of 0.4 mile of way would remain open for vehicle use in the 191 acres recommended nonsuitable for wilderness.

Partial Wilderness

Under the partial alternative, 20,727 acres of the Badlands WSA would be recommended suitable for wilderness designation (see Map 4). An attempt would be made to acquire the 40-acre private inholding which could be acquired through purchase or exchange with willing landowners. Assuming acquisition of this parcel, the total area recommended suitable under this alternative would be 20,767 acres. A total of 31.6 miles of ways would be closed.

North and south boundaries of the area under this alternative would be defined by a combination of private property as well as BLM and county-maintained bladed roads. In the northwest corner, the boundary would be a fence along a section line between the recommended wilderness and a narrow arm of the WSA recommended as nonsuitable. The western boundary would be a combination of U.S. Highway 20, adjacent private property, low standard dirt roads and a fence around Reynolds Pond. The eastern boundary would be formed by a low standard dirt road.

The remaining 11,494 acres would be recommended as nonsuitable for wilderness designation.

Energy and Mineral Development Actions

Wilderness designation would close 20,767 acres in the WSA to energy and mineral entry assuming acquisition of 40 acres of private land. Approximately 320 acres recommended as nonsuitable, which have a moderate potential for the occurrence of sand and gravel, would be open for material sale or free-use. Exploration for sand and gravel resources would involve surface examination and trenching. However, no development of a sand and gravel operation is expected because of the large supply available outside the area and relatively low demand for this material.

Wildlife Habitat Management Actions

In the suitable portion, habitat would be managed to support existing wildlife populations in accordance with ODFW management goals consistent with BLM Wilderness Management Policy. In the portion recommended nonsuitable, habitat would be managed in accordance with ODFW management goals. The primary way in which wildlife habitat is managed is through close coordination with the livestock grazing allotment management plan goals to ensure adequate forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the present level of approximately 1,100 AUMs in all of one allotment and portions of five other allotments. The season of use would remain as shown in Table 4. Day-to-day management of livestock and inspection/maintenance of 8 miles of interior fence would be done on horseback. While 31.6 miles of ways would be closed, water hauling would occur on 13 miles of these ways using a truck, approximately three times each week during either the spring, summer or fall grazing season.

In the long term, livestock use would increase by 56 AUMs in the nonsuitable portion through construction of 6 miles of fence needed to improve the distribution and timing of grazing, 1,520 acres of juniper thinning which would result in increased livestock forage production, and additional brush control/seeding on 130 acres. Vehicle use would continue on 26.5 miles of ways for livestock inspection, project inspection/maintenance and water hauling.

Wood Products Harvest Actions

Wilderness designation would close 20,767 acres within the WSA to wood harvest. Although a total of 11,494 acres would be available for wood harvest, firewood cutting would primarily occur on 6,160 acres in the eastern part of the WSA. It is estimated that an annual harvest of 150 cords of juniper firewood would occur under this alternative on approximately 30 acres annually. In addition, juniper cutting of 1,520 acres for livestock grazing would result in a harvest of 4,500 cords of firewood on a commercial basis. The total long-term firewood harvest level would be approximately 12,000 cords.

Recreation Management Actions

Under this alternative, 20,767 acres recommended suitable for wilderness designation, including 31.6 miles of ways, would be closed to motorized vehicles. Current recreation use of the entire area is estimated to be 10,000 visitor days per year for sightseeing, target practice, hiking, hunting and photography as well as recreational ORV use on the ways. This existing use is limited to the existing ways through vehicle designation. A total of 26.5 miles of ways would remain open for vehicle use in the 11,494 acres recommended nonsuitable for wilderness.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 32,221-acre WSA would be open to mineral and energy entry. Exploration of the 3,010-acre area which has a moderate potential for the occurrence of sand and gravel would involve surface examination and shallow trenching and would disturb 0.25 acre. It is projected that exploration would find one area with good quality sand and gravel. Operations would involve construction of a 0.5 mile access road and use of a portable rock crusher. Total surface disturbance within the WSA is estimated to be 15 acres. The open pit would cover a total of one acre at any given point in time, since as the pit is depleted it would be reclaimed before the operation moved to another location.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife. Prescribed burning of sagebrush and juniper would occur on 4,000 acres to increase wildlife habitat diversity.

Livestock Management Actions

In the short term, livestock use would remain at the current level of 1,100 AUMs in portions of seven allotments. In the long term, livestock use would increase by 200 AUMs to 1,300 AUMs. This would occur as a result of construction of 13 miles of fence to improve livestock distribution and the timing of grazing use, the thinning of 2,500 acres of juniper by commercial woodcutter (to improve forage production) and brush control/seeding of 730 acres. Fifteen miles of pipeline would be constructed along existing ways to eliminate the need to haul water to the livestock. The season of use would remain as shown in Table 4, but deferred rotation grazing management would be implemented in the Lava Beds allotment and the existing deferred rotation management in the Rambo allotment would be improved. Vehicles would use 58.1 miles of ways for livestock inspection and project inspection/maintenance which would amount to approximately 10-15 trips per year.

Wood Products Harvest Actions

All of the 32,221 acres would be available for wood harvest although firewood cutting would primarily occur on 6,160 acres in the eastern part of the WSA. It is estimated that an annual harvest of 150 cords of juniper firewood would occur under this alternative on approximately 30 acres annually. In addition, thinning 2,500 acres for livestock management would result in a firewood harvest of 6,000 cords over a 5-year period. The total long-term firewood harvest level would be approximately 13,500 cords.

Recreation Management Actions

Vehicle use would continue on 58.1 miles of ways in the WSA. The current recreation use level of this area is estimated to be 10,000 visitor days per year for such activities as sightseeing, hiking, hunting, target practice, photography and for recreational ORV use on the ways. This existing ORV use is limited to the existing ways through vehicle designation.

Summary

Table 1 summarizes the proposed management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

Introduction

This section discusses only those major environmental conditions that describe the character of the study area or that may be affected by the alternatives.

Wilderness Values

Naturalness

Most portions of the Badlands WSA appear to be in a natural condition and primarily affected by the forces of nature. Twenty-nine unnatural interior features influence approximately 26 percent of this WSA.

Unnatural features in the WSA are dispersed throughout and include 23.6 miles of fence, two reservoirs, two wildlife guzzlers, 3,160 acres of an old firewood cutting area and 58.1 miles of ways.

Most vehicle ways are reverting to a natural appearance and are becoming less apparent primarily due to the sandy, rocky terrain and infrequent use.

The old 3,160-acre woodcutting area is in the northeastern portion and is less natural in character than the remainder of the WSA. There is good potential for rehabilitating this area. In addition, 5,735 acres of the WSA are part of the BLM Millican Valley Off-Road Vehicle (ORV) Recreation Area. Dirt bikers and other ORV enthusiasts often travel the existing trails in this part of the WSA; however, the natural character of these lands has not been substantially affected due to the rocky, sandy characteristics of the terrain.

Unnatural features outside of the WSA that adversely affect its naturalness include sights and sounds from U.S. Highway 20, a crested wheatgrass seeding south of the WSA and farm buildings north of the WSA near the community of Alfalfa. The canal on the north boundary is also an unnatural feature.

These features do not have a significant effect on the naturalness of the WSA since they are generally screened from view by topography and/or vegetation. In addition, the large size and overall naturalness of the WSA further reduce any intrusive influences these features might have.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The Badlands WSA has outstanding opportunities for solitude due to its large size and compact shape. Its topographic and vegetative screening also contribute to the area's opportunities for solitude.

Numerous sandy basins ringed with basalt flows and dense clusters of juniper trees are concentrated in the middle of the study area. The basalt flows and dense juniper cover offer ideal locations for anyone seeking a high degree of seclusion. The area has a more open and flat character in the eastern and western portions.

The junipers are not as dense in the northeastern portion of the WSA and the basalt ridges are less pronounced in that area. As a result, there are fewer opportunities for solitude and primitive recreation in those areas than in other parts of the WSA. Opportunities for solitude and primitive recreation are also limited in a narrow arm that projects from the north boundary of the WSA. Visitors in that area would also have fewer opportunities to avoid other visitors than in the central portion of the study area because there are fewer basalt ridges.

Outstanding opportunities for several different types of primitive recreation are available in the study area, including hunting, nature study, photography, sightseeing and horseback riding.

There are also outstanding opportunities for hiking in the Badlands. Such hiking can be challenging because the topography and especially the dense stands of juniper trees create an impression of sameness or uniformity for first time or casual visitors in this area. It is very difficult for hikers to accurately determine their location due to the size and topography of the area and the numerous juniper trees. The height and density of the juniper trees make distant landmarks difficult to locate. The rugged, isolated environment also provides excellent opportunities for primitive camping.

Special Features

Special features within the Badlands WSA have cultural, geological, botanical and zoological appeal.

Prehistoric and historic sites have been found within the WSA which offer special opportunities for cultural resource studies (see the Cultural Resources section).

The Dry River, a dry, prehistoric river channel, winds through the study area. Erosion has created interesting features in the southeast portion of the study area such as carved and smoothed boulders and small, narrow cuts through basalt ridges. There are also countless basalt pressure ridges formed by the compressive force of slowly moving subcrustal lava with many shapes and formations. These pressure ridges are mainly in the center of the WSA.

Cryptogams (mosses, lichens, etc.) grow on the basalt formations throughout the area and are a special attraction for some visitors. Crucial mule deer winter range covers the southern portions of the study area (see Map 2).

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and has juniper steppe woodland with juniper as its potential natural vegetation. Of the vegetative communities listed in the High Lava Plains section of the Oregon Natural Heritage Plan, the WSA has western juniper/big sagebrush/wheatgrass and western juniper/Idaho fescue ecosystems.

Six standard metropolitan statistical areas with populations over 100,000 are within five hours' driving time of the Badlands WSA: Medford, Eugene/Springfield, Portland and Salem, Oregon; and Richland/Kennewick/Pasco and Yakima, Washington.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical rock chip sampling. Technical details of the evaluation are found in a BLM report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Badlands WSA". The area has been classified according to a rating system that indicates both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral potential classifications in the WSA. Map 5 shows the portions which have been rated moderate for sand and gravel.

Exposed rocks in the WSA are Tertiary and Quaternary basalt flows. Subsurface rocks are probably Tertiary and Quaternary stream and lake sediments consisting of gravel, sands and silts of volcanic origin.

Energy Resources

Geothermal potential of the WSA is rated low. The WSA is located between Newberry Volcano and Powell Buttes, which have moderate to high geothermal favorability. Drilling and testing in Newberry Volcano and on its north flank indicate a heat source is probably located close to the crater itself. Drilling and testing on the northwest flank of Powell Buttes have shown a moderate temperature source. The extent of this geothermal resource is only speculative at this time.

As of October 16, 1987, no geothermal or oil and gas leases have been issued in the WSA.

Mineral Resources

Rock chip samples indicate a lack of favorability for any metallic mineral. Some unknown amount of surface volcanic rock has been removed from the area for use as facing stone but the real extent and use of this resource are not great. A moderate potential exists in two areas for sand and gravel as shown on Map 5. As of October 16, 1987, no mining claims were on file for lands within the WSA.

Vegetation

Western juniper is the dominant vegetation in the Badlands WSA. Almost all of the area is within a juniper forest. Understory species include big sagebrush, gray and green rabbitbrush, bitterbrush, squirreltail grass, bluebunch wheatgrass, Idaho fescue, and cheatgrass along with many forbs. Most of the vegetation of the area is in early seral stage. The rest of the WSA is in mid-seral stage. The potential natural community of the WSA is predominantly an Idaho fescue type with a western juniper overstory. Other plants include big sagebrush, bitterbrush, and bluebunch wheatgrass in lesser amounts. Very little Idaho fescue or bluebunch wheatgrass remains in the study area and there is a corresponding abundance of sagebrush and rabbitbrush, as well as a prolific spread of western juniper.

The abundance of western juniper is related to several factors including a lack of natural fire and a lack of competition from other plant species as a result of historic grazing practices. The end result is western juniper in places and in an abundance which was not a natural occurrence years ago.
There are no threatened or endangered plant species in the WSA.

Wildlife

A representative sampling of wildlife species found in the WSA includes bobcats, flickers, robins and golden eagles. Approximately 65 mule deer and 10 antelope inhabit the WSA on a year-round basis. The WSA is considered crucial winter range for mule deer. The only fish in the WSA occur in Reynolds Pond where largemouth bass are present. Wildlife habitat is generally in fair condition, being significantly influenced by the dominant old-growth juniper.

Watershed

There are no perennial streams within the WSA. Reynolds Pond and a small, unnamed pond in the northwest part of the WSA are the only surface waters. Dry River is the only significant drainage in the WSA and ephemeral water is present only during the early spring.

There are no watershed problems in the WSA due to the predominately flat topography and coarse, sandy soils. While there are various opportunities available to increase the cover of herbaceous vegetation such as prescribed burning and seeding, none of these activities would have an effect on watershed conditions. For this reason, watershed will not be discussed further in this document.

Livestock Grazing

Portions of six grazing allotments and all of one allotment are located within the WSA. Table 4 summarizes the existing livestock use.

Existing livestock developments include 23.6 miles of barbed wire fence and two reservoirs. The 58.1 miles of ways in the WSA are used primarily for general livestock supervision and inspection and repair of existing fences. Most of the everyday livestock work requires horses due to the rocky nature of the WSA.

While most of the ways are used by livestock operators only 10 to 15 times per year, 15 miles of ways in the center and eastern part of the WSA are used up to three times per week to haul water to livestock. Due to the general lack of perennial water in the WSA, all water for livestock is hauled to portable water troughs placed in the allotments. A truck is used for this purpose. This activity occurs during either the spring, summer, or fall grazing season.

Wood Products Harvest

Prior to designating the Badlands area as a WSA, juniper firewood had been harvested from 3,160 acres in the northeast portion of the area, primarily to maintain existing livestock forage. It is estimated that this area still contains a total of about 6,000 cords.

More than 1,000 firewood cutting permits are issued annually for areas of similar character and accessibility as the Badlands, indicating local demand for the wood.

Cultural Resources

Three prehistoric sites, including two pictograph sites (a rare type of site in this part of Oregon) and a campsite or tool manufacturing site have been discovered in the WSA. A route labeled “old immigrant road” was mapped in the 1880s and probably represents a route established between the Willamette Valley and Harney Valley to assist people traveling across Central Oregon. It may also overlay the Meek’s Wagon Train route of 1845. It is not known if there is currently any evidence of this route left on the ground.

Illegal digging by artifact collectors has damaged some sites.

Recreation Use

Recreation use in the WSA is heavy year-round and includes camping, photography, hiking, hunting for deer and general sightseeing. The heaviest uses include people using ORVs on existing ways and target practicing. This area is a good place to get away for a few hours since it is very close to an urban area (Bend). The 58.1 miles of ways provide a large area to explore by vehicle. Overall recreation use in the WSA is estimated to be 10,000 visitor days per year and is projected to increase by two to five percent per year.

Local Personal Income

Livestock use at the current level of 1,100 AUMs and recreation use totaling 10,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $13,200 for livestock grazing and $120,000 related to recreation use of the WSA, for an overall total of $133,200. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness Alternative

Recommended suitable for wilderness: 32,221 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

Wilderness values within the entire 32,221 acres would be protected by legislative mandate through wilderness designation. Wilderness values such as naturalness, solitude and outstanding opportunities for primitive and unconfined recreation would be protected. Special features including cultural resources, geologic formations, botanic values and crucial mule deer winter range would continue to be protected.

Naturalness

The naturalness of the area's basalt pressure ridges, sheltered sandy basins, massive juniper forest and other natural areas within the WSA (approximately 74 percent of the WSA is pristine, uninfluenced by unnatural features) would be enhanced by prohibiting motorized vehicle use. Closure of 58.1 miles of ways which influence approximately 596 acres (only two percent of the WSA due to the rugged topography and dense juniper forest), would allow the ways to revegetate. Except for 15 miles of ways, these ways would begin to revegetate within two to three growing seasons. Approximately 15 miles of ways would be used by livestock operators to haul water for livestock. This use would occur three times per week during April through November. Approximately one mile of way would be used by heavy equipment under permit once every 10 to 15 years to maintain two reservoirs, but this infrequent use would still allow revegetation.

Solitude

Existing opportunities for solitude provided by the area's large size, rugged topography and dense juniper forest would be enhanced by eliminating motor vehicle use on the 58.1 miles of ways. Except for water hauling by livestock operators on 15 miles of ways, vehicles would be limited to the boundary roads in the southern and eastern portions of the WSA. This reduction in motorized access would provide a large core area for people to hike into and experience solitude with little disturbance from motorized vehicle use.

Primitive and Unconfined Recreation

Closure of 58.1 miles of ways to motorized vehicle use would increase opportunities for hunting, nature study, sightseeing, photography, hiking, backpacking, camping and horseback riding. The quality of these experiences would improve by not allowing vehicle use on the ways. A more natural, primitive, wild setting would be provided. A total of 43.1 miles of ways would be allowed to revegetate.

These opportunities would continue to be reduced in the vicinity of the 15 miles of ways used by livestock operators to haul water for livestock. These ways would not be allowed to revegetate and would continue to affect the quality of primitive and unconfined recreation.

Special Features

Eliminating motorized vehicles on 58.1 miles of ways and allowing the ways to revegetate (except for 15 miles used for water hauling during the livestock grazing season) would preserve and enhance special features. There would be less access to cultural resources and therefore less opportunity for vandalism. There would also be less disturbance to wintering mule deer.

Conclusion: Wilderness designation of the entire 32,221 acres within the Badlands WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 32,221 acres within the WSA to energy and mineral entry. Exploration for, and sale or free-use of, sand and gravel would be precluded.

Energy Development

Exploration and development of energy resources are not projected in the WSA due to low potential.

Conclusion: No impact to energy development is expected.

Mineral Development

Surface-disturbing exploration and development of sand and gravel deposits on 3,010 acres would be precluded. One projected sand and gravel pit would not be developed.

Conclusion: Projected production from one sand and gravel operation would be foregone.

Impacts on Vegetation

Revegetation would occur on 43.1 miles of the total 58.1 miles of ways closed to motorized vehicles. A total of 42 acres would revegetate in the long term.

Conclusion: Revegetation would occur on 42 acres.

Impacts on Wildlife

Wildlife habitat would remain largely as it is at present. Disturbance of wildlife, especially wintering mule deer, would decrease through closure of 58.1 miles of ways. Deer survival would improve and the number of animals would increase by 20-25 percent in the long term. Fish would not be affected. ODFW management goals would be met.

Conclusion: Wildlife habitat would be slightly improved, resulting in an increase of 20 to 25 percent of the mule deer population.

Impacts on Livestock Grazing

Livestock use would remain at the current level of 1,100 AUMs in portions of six grazing allotments and in one allotment entirely within the WSA. Vehicle use for livestock management and inspection and maintenance of 23.6 miles of fence would be precluded on 58.1 miles of ways, resulting in some inconvenience and slight additional expense to the livestock operators. Day-to-day livestock management would continue to be by horseback. Water for livestock would be hauled in by truck on 15 miles of ways. This would occur three days a week during the spring, summer or fall grazing season. A total of 200 AUMs of potential additional livestock forage would be foregone since the juniper thinning, seeding and fencing necessary to make this forage available would be precluded under this alternative.

Conclusion: Total livestock use would remain at 1,100 AUMs. A potential increase of 200 AUMs would be foregone. Vehicle use for livestock-related activities would be precluded on 43.1 miles of ways with some inconvenience and a slight additional expense to livestock operators. Hauling of water for livestock would continue on 15 miles of ways.

Impacts on Wood Products Harvest

A projected annual harvest of 150 cords of juniper firewood from programmed harvesting (7,500 cords in the long term) as well as 6,000 cords of commercial firewood made available through juniper thinning would be foregone under this alternative.

Conclusion: The long-term harvest of 13,500 cords of juniper firewood would be foregone.

Impacts on Recreation Use

Vehicle-oriented recreation use by campers, hikers, hunters, photographers and sightseers would be eliminated from the area since all 58.1 miles of ways would be closed to motorized vehicles. ORV use and target shooting would be displaced to other public land in the general area outside the WSA. This reduction in vehicle-oriented use would amount to 6,000 visitor days per year in the short term. With the elimination of motorized vehicles in the WSA, except for water hauling, the quality of primitive, non-motorized recreation activities would increase. There would be a more natural setting for camping, hiking, hunting and photography. In the short term, primitive recreation use of the area would not increase substantially. In the long term, as the demand for this type of recreation increased, recreation use would increase by 3,000 visitor days per year for a total use level of 7,000 visitor days per year.

Conclusion: The area's recreation use level of 10,000 visitor days per year would decrease by 6,000 visitor days per year in the short term. In the long term, visitor use would be expected to increase to 7,000 visitor days per year and would then continue to increase at an expected rate of two to five percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 1,100 AUMs. Overall recreation use would decrease by 3,000 visitor days per year in the long term.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $36,000 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $36,000.

Proposed Action

Recommended suitable for wilderness: 32,070 acres, assuming acquisition of 40 acres of private land.

Recommended nonsuitable for wilderness: 191 acres

Impacts on Wilderness Values

The proposed action would add 32,070 acres to the NWPS, assuming acquisition of the 40-acre inholding. Almost all portions of the WSA would be designated wilderness and the wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including cultural resources, geologic formations, botanic values and crucial mule deer winter range would continue to be protected. Acquisition of the 40-acre inholding would ensure the preservation of naturalness and opportunities for solitude and primitive recreation.

Naturalness

In the 32,070 acres recommended suitable for wilderness, impacts on naturalness would be similar to the all wilderness alternative except that the proposed action also includes the acquisition of 40 acres of private land. Closure of 57.7 miles of ways would allow these ways to revegetate and reduce their unnatural influence on approximately 586 acres, approximately two percent of the WSA. Except for 15 miles of ways used by livestock operators to haul water to livestock, these ways would begin to revegetate within two to three growing seasons. These 15 miles of ways would receive motorized vehicle use two to three times per week from April through November. Approximately 0.6 mile of way would be used by heavy equipment under permit every 10 to 15 years to maintain two reservoirs, but this infrequent use would still allow revegetation.

The remaining 191 acres recommended nonsuitable for wilderness would not receive special legislative protection. The wilderness value of naturalness would be vulnerable to the effects of continued vehicle use on 0.4 mile of way.

Solitude

In the area recommended suitable for wilderness the impacts on solitude would be similar to the all wilderness alternative.

Eliminating motorized vehicle use on 57.7 miles of ways would increase solitude opportunities except for the three times per week use of 15 miles of ways by livestock operators to haul water to livestock during the grazing season. As under the all wilderness alternative, closing the ways would increase the size of the area where a wilderness visitor could experience solitude without disturbance by motorized activities.

For the area recommended nonsuitable for wilderness, solitude would continue to be influenced by motor vehicle use on 0.4 mile of way.

Primitive and Unconfined Recreation

In the 32,070-acre area recommended suitable for wilderness, the same increased opportunities for primitive and unconfined recreation identified under the all wilderness alternative would occur under this alternative through closure of 57.7 miles of ways. Increased opportunities for primitive and unconfined recreation activities would be provided for nature study, photography, hiking, camping, sightseeing, hunting and horseback riding. The quality of these experiences would be improved by removing vehicles and allowing the vehicle ways to revegetate. A more natural, primitive setting would be provided.

These opportunities would continue to be reduced in the vicinity of 15 miles of ways used by livestock operators to haul water for livestock. These ways would not be allowed to revegetate and would continue to affect the quality of primitive and unconfined recreation.

Vehicle use would continue on 0.4 mile of way in the 191-acre area recommended nonsuitable for wilderness and would continue to intrude upon primitive, non-motorized recreation opportunities such as nature study, hiking and horseback riding in this area.

Special Features

The impacts to special features would be similar to those under the all wilderness alternative. The elimination of motorized vehicle use on 57.7 miles of ways, except for water hauling during the livestock grazing season, would reduce existing impacts to special features, including less access to cultural resources and therefore less opportunity for vandalism. There would also be less disturbance to wintering mule deer. The acquisition of the 40-acre inholding would further increase the protection of these special features.

In the 191 acres recommended nonsuitable for wilderness, there would be no impacts to special features since none are known to exist in this area.

Conclusion: Wilderness designation of 32,070 acres would protect and enhance existing wilderness values. The acquisition of 40 acres of private land would further enhance the area recommended suitable by preserving wilderness values on all lands within the proposed wilderness boundary. In the 191 acres recommended nonsuitable, naturalness, solitude and primitive and unconfined recreation opportunities would continue to be impaired by motor vehicle use and would experience further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 32,070 acres in the WSA to energy and mineral entry, assuming acquisition of 40 acres of private land. The 191 acres recommended nonsuitable for wilderness would be open for energy and mineral entry.

Energy Development

Exploration and development of energy resources are not projected in the WSA due to low potential.

Conclusion: No impact to energy development is expected.

Mineral Development

Surface-disturbing exploration for sand and gravel would be precluded on 3,010 acres in the WSA which have a moderate potential for the occurrence of this mineral. Development of one sand and gravel operation would be precluded. No development is projected on the 191 acres recommended nonsuitable for wilderness due to relatively low demand and availability of sand and gravel in other areas.

Conclusion: Projected production from one sand and gravel operation would be foregone.

Impacts on Vegetation

Revegetation would occur on 42.7 miles of the total 57.7 miles of ways closed to motorized vehicles. A total of 41 acres would revegetate in the long term.

Conclusion: Revegetation would occur on 41 acres.

Impacts on Wildlife

Wildlife habitat would remain largely as it is at present. Disturbance of wildlife, especially for the wintering mule deer, would decrease through the closure of 57.7 miles of ways. Mule deer winter survival would improve and the population would increase by 20-25 percent in the long term. Fish would not be affected. ODFW management goals would be met.

Conclusion: Wildlife habitat would be improved, resulting in 20 to 25 percent increase in mule deer populations.

Impacts on Livestock Grazing

In the 32,070 acres recommended suitable for wilderness, livestock use would remain at the current level. Vehicle use for livestock management and inspection and maintenance of 23.2 miles of fence would be precluded on 57.7 miles of ways, resulting in some inconvenience and slight additional expense to the livestock operators. Day-to-day livestock management would continue to be by horseback. A truck would be used on 15 miles of ways to haul water for livestock. This would occur three days a week during the period April through November. A total of 200 AUMs of potential additional livestock forage would be foregone since the juniper thinning, seeding and fencing necessary to make this forage available would be precluded under this alternative.

In the 191-acre area recommended nonsuitable for wilderness, livestock use would remain at the current level. Vehicle use for livestock-related activities would be allowed on 0.4 mile of way.

Conclusion: Total livestock use would remain at 1,100 AUMs. An additional 200 AUMs would be foregone. Vehicle use for livestock-related activities would be precluded on 42.7 miles of ways resulting in some inconvenience and slight additional expense to livestock operators. Hauling of water for livestock would continue on 15 miles of ways.

Impacts on Wood Products Harvest

A projected annual harvest of 150 cords of juniper firewood from programmed harvest (7,500 cords in the long term) as well as 6,000 cords of commercial firewood made available through juniper thinning would be foregone under this alternative.

Conclusion: The long-term harvest of 13,500 cords of juniper firewood would be foregone.

Impacts on Recreation Use

Vehicle-oriented recreation use by campers, hikers, hunters, photographers and sightseers would be eliminated from the area since all but 0.4 mile of way would be closed to motorized vehicles. ORV use and target shooting would be displaced to other public land in the general area outside the WSA. This reduction in vehicle-oriented use would amount to 6,000 visitor days per year in the short term. With the elimination of motorized vehicles in the WSA, except for water hauling, the quality of primitive, nonmotorized recreation activities would increase. There would be a more natural setting for camping, hiking, hunting and photography. In the short term, primitive recreation use of the area would not increase substantially. In the long term, as the demand for this type of recreation increased, recreation use would increase by 3,000 visitor days per year. Total use would then be projected to be 7,000 visitor days per year.

Conclusion: The area's recreation use level of 10,000 visitor days per year would decrease by 6,000 visitor days per year to 4,000 visitor days per year in the short term. In the long term, visitor use would be expected to increase to 7,000 visitor days per year and then continue to increase at a rate of from two to five percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 1,100 AUMs. Overall recreation use would decrease by 3,000 visitor days per year in the long term.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $36,000 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $36,000.

Partial Wilderness

Recommended suitable for wilderness: 20,767 acres
Recommended nonsuitable for wilderness: 11,494 acres

Impacts on Wilderness Values

Wilderness values on 20,767 acres within the WSA would receive special protection through legislative mandate. The preservation of wilderness values including naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including cultural resources, geologic formations, botanic values and crucial mule deer winter range would continue to be protected in this area.

The remaining 11,494 acres in the area recommended nonsuitable for wilderness would not receive special legislative protection. Wilderness values including naturalness, solitude and primitive and unconfined recreation would be vulnerable to the effects of projected management actions. These actions would include minerals (sand and gravel) exploration and development, continued vehicle use for livestock management and recreation, livestock development projects and juniper firewood harvest.

Naturalness

In the 20,767-acre area recommended suitable for wilderness, the naturalness of the area's volcanic maze of lava pressure ridges, dense forest of old juniper trees and numerous sandy basins would be enhanced by prohibiting vehicle use. Closure of 31.6 miles of ways which influence approximately 329 acres (approximately two percent of this portion of the WSA), would allow 18.6 miles of these ways to revegetate and eventually become unnoticeable. Vehicle use on 13 miles of these ways for livestock water hauling would continue to maintain the impact of these ways on naturalness.

In the 11,494-acre area recommended nonsuitable for wilderness, vehicle use on 26.5 miles of ways would continue to maintain the impact of vehicle tracks upon naturalness on approximately 267 acres (approximately two percent of this portion of the WSA). Most of this influence upon the area's naturalness would occur near the eastern boundary.

Exploration for sand and gravel would result in limited surface disturbance (exploration pits and cross-county access). Reclamation would be required and natural revegetation would leave little evidence of disturbance to naturalness.

The proposed livestock developments including 1,520 acres of juniper thinning and 130 acres of sagebrush control and seeding would visually influence naturalness on 6,160 acres, reducing its quality in areas where these activities occurred. These proposed projects would increase allocated livestock forage by 56 AUMs which would increase trampling around water troughs. Construction of 6 miles of fence would provide better livestock management which would improve the naturalness of 2,000 acres. However, the fence, an unnatural feature in itself, would visually influence naturalness on 300 acres.

Juniper thinning/woodcutting would reduce naturalness on 6,160 acres in the east portion of the WSA.

Solitude

In the area recommended suitable for wilderness, opportunities for solitude provided by the size, shape, topography and dense forest of juniper trees would be available. These opportunities for solitude would be further enhanced by eliminating motorized vehicle use on 31.6 miles of ways. The use of 13 miles of way for water hauling would continue to affect solitude three times per week in areas adjacent to this activity.

Vehicle use would be limited to the 26.5 miles of ways within the area recommended nonsuitable for wilderness. Human activities associated with livestock management and development, woodcutting activities and motorized recreation use would cause repeated local impairment of solitude opportunities as well as loss of vegetative screening within and adjacent to areas where these activities would occur.

Primitive and Unconfined Recreation

Within the 20,767 acres recommended suitable for wilderness, the closure of 31.6 miles of ways to motorized vehicle use (except for periodic use of 13 miles of ways by livestock operators) would increase opportunities for primitive and unconfined recreation opportunities such as nature study, photography, hunting, hiking, camping and horseback riding.

By removing vehicles and allowing the vehicle ways in this area to revegetate, the quality of these primitive and unconfined recreation activities would also be improved. A more natural, wild setting would be provided.

Within the 11,494 acres recommended nonsuitable for wilderness, vehicle use would continue to be limited to 26.5 miles of vehicle ways. This use would continue to intrude on primitive, non-motorized recreation opportunities in the vicinity of these ways in this portion of the WSA.

Livestock developments and woodcutting activities would also reduce primitive recreation opportunities such as nature study, hiking and horseback riding.

Special Features

In the 20,767 acres recommended suitable for wilderness, the elimination of motorized vehicle use on 31.6 miles of ways, except for water hauling on 13 miles of ways during the livestock grazing season, would reduce existing impacts to special features, including less access to cultural resources and therefore less opportunity for vandalism. There would also be less disturbance to wintering mule deer. The acquisition of the 40-acre inholding would further increase the protection of these special features in this area.

In the 11,494 acres recommended nonsuitable for wilderness, vehicle use and access on 26.5 miles of ways would continue to disturb wintering mule deer and provide an opportunity for vandalism to cultural resources. Projected juniper thinning and woodcutting would improve the crucial mule deer winter range. There would be no impact on geologic or botanic special features.

Conclusion: Designation of 20,767 acres within the Badlands WSA would result in protection and enhancement of existing wilderness values in this area. Within the 11,494 acres recommended nonsuitable for wilderness, projected management activities would both directly and indirectly impair wilderness values on 8,377 acres of the WSA with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 20,767 acres in the WSA to energy and mineral entry assuming acquisition of 40 acres of private land. The 11,494 acres recommended as nonsuitable would be open for energy and mineral entry.

Energy Development

Exploration and development of energy resources are not projected in the WSA due to low potential.

Conclusion: No impact to energy development is expected.

Mineral Development

Surface-disturbing exploration for sand and gravel would be precluded on 2,690 acres of the 3,010 acres within the WSA which have a moderate potential for occurrence of this material. No development is projected on the remaining 320 acres open to mineral entry due to relatively low demand and availability of sand and gravel in other areas.

Conclusion: Projected development of one sand and gravel operation would be foregone.

Impacts on Vegetation

In the area recommended suitable for wilderness, revegetation would occur on 18.6 miles of the total 31.6 miles of ways closed to motorized vehicles. A total of 18 acres would revegetate in the long term.

In the area recommended nonsuitable for wilderness, seral status of 7,680 acres would change from a predominately early seral juniper community toward a late seral sagebrush/bunchgrass community through juniper thinning and woodcutting. The dominate juniper overstory would be reduced and there would be a corresponding increase in understory grasses and forbs. For 130 acres of early seral sagebrush the vegetation would change to a seeded community dominated by crested wheatgrass. Seral status of another 2,000 acres of early seral sagebrush and juniper communities would change toward late seral status through improved livestock management. In all instances herbaceous residual ground cover would increase. Fence construction would disturb vegetation on six acres.

Conclusion: Revegetation would occur on 18 acres. Projected management actions would change 7,680 acres from early seral status juniper toward late seral status sagebrush/bunchgrass and 130 acres from an early seral sagebrush community to a seeded community. A total of 2,000 acres of early seral status sagebrush and juniper would change toward late seral status and vegetation would be disturbed on six acres.

Impacts on Wildlife

In the area recommended suitable for wilderness, disturbance of wildlife would be decreased through the closure of 31.6 miles of ways. Wintering mule deer and antelope would not be disturbed in this area. Through an increase in winter survival the deer population would increase by ten percent in the long term. Otherwise, wildlife habitat would generally remain as it is.

In the area recommended nonsuitable for wilderness, vehicle use on 26.5 miles of ways would continue to disturb wildlife. Slight improvement of crucial deer winter range would occur through the thinning of 1,520 acres of juniper. More forage for mule deer and antelope would be provided and the mule deer population would be expected to increase by an additional ten percent in the long term. Fish would not be affected.

Conclusion: Wildlife habitat would be slightly improved, resulting in a ten percent increase in mule deer populations.

Impacts on Livestock Grazing

In the area recommended suitable for wilderness, livestock use would remain at the current level. Vehicle use for livestock management and inspection and maintenance of 8 miles of fence would be precluded on 31.6 miles of ways resulting in some inconvenience and slight additional expense to the livestock operators. Day-to-day livestock management would continue to be by horseback. A truck would be used on 13 miles of ways to haul water for livestock. This would occur three days a week during either the spring, summer or fall grazing season. A total of 144 AUMs of potential additional livestock forage would be foregone since the juniper thinning, seeding and fencing necessary to make this forage available would be precluded under this alternative.

In the area recommended nonsuitable for wilderness, livestock use would increase by 56 AUMs, from 580 AUMs to 636 AUMs, through implementation of 1,520 acres of juniper thinning, 130 acres of sagebrush control and seeding and construction of 6 miles of management fence. A total of 26.5 miles of ways would remain open to vehicle use for livestock management-related activities. Livestock grazing management would improve through the construction of 6 miles of management fence.

Conclusion: Livestock use would increase from 1,100 AUMs to 1,156 AUMs through projected management actions. A potential additional 144 AUMs would be foregone. Vehicle use for livestock-related activities would be precluded on 18.6 miles of ways, resulting in some inconvenience and a slight additional expense to livestock operators. Hauling of water for livestock would continue on 13 miles of ways.

Impact on Wood Products Harvest

Juniper firewood cutting would be precluded in the 20,767 acres recommended suitable for wilderness. A total of 1,500 cords of firewood harvest would be foregone since 980 acres of juniper thinning for livestock grazing management would be precluded.

In the area recommended nonsuitable for wilderness, firewood cutting would occur on 6,160 acres in the eastern part of the WSA. This would result in an annual harvest of 150 cords. The long-term harvest would be 7,500 cords. An additional 4,500 cords would be realized as a result of 1,520 acres of juniper thinning for livestock grazing management.

Conclusion: A long-term harvest of 12,000 cords of juniper firewood would be realized. A total of 1,500 cords of firewood harvest would be foregone.

Impacts on Recreation Use

In the 20,767-acre area recommended suitable for wilderness, the closure of 31.6 miles of ways would result in a change to primitive, non-motorized recreation use such as hiking, camping, nature study, photography and sightseeing. In the area recommended nonsuitable for wilderness, these same activities would occur as a part of motorized recreation use on 26.5 miles of ways left open to vehicles. ORV use on these ways and target shooting would also occur in this area.

This alternative would result in a long-term, net overall increase in recreation use. Both motorized and non-motorized activities would have access to historic use areas, and the quality of non-motorized recreation would increase in the area recommended suitable for wilderness.

Conclusion: The area's current recreation use level of 10,000 visitor days per year would remain. There would be a two to five percent annual rate of increase in the long term.

Impacts on Local Personal Income

Livestock grazing would increase by 56 AUMs. Overall recreation use would remain at 10,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of approximately $700 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $700.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 32,221

Impacts on Wilderness Values

Under this alternative, none of the 32,221 acres would be designated wilderness and wilderness values of naturalness, solitude, primitive and unconfined recreation and the area's special features would be subject to the effects of projected management actions.

Projected management actions include disturbance of 15 acres for exploration and development of mineral (sand/gravel) resources, 730 acres of brush control and seeding, 2,500 acres of juniper control, 13 miles of fence, an increase in the livestock forage allocation by 200 AUMs, 15 miles of livestock water pipeline, 4,000 acres of prescribed burning for wildlife and 6,160 acres of juniper cutting for firewood. Vehicle use would continue on the 58.1 miles of ways in the WSA.

Naturalness

Vehicle use on the 58.1 miles of ways would continue the impact of vehicle tracks upon naturalness on approximately 596 acres (two percent of the WSA). This influence upon the area's naturalness would occur throughout the WSA and would not be concentrated, except in the Reynolds Pond area. Mineral (sand and gravel) exploration and development would result in surface disturbance of 15 acres and would visually influence 623 acres. Reclamation would be required and natural revegetation would be expected in the long term.

Naturalness would be reduced in the short term in the 8,660 acres proposed for woodcutting and juniper thinning and in the 4,000 acres proposed for prescribed burning. In the long term, overall naturalness would be increased through the reintroduction of fire into the ecosystem and through a reduction in the canopy of western juniper. The proportion of western juniper to other plant species would more nearly approach the potential natural community. The 730 acres of brush control and seeding would reduce naturalness in both the long and short term. The introduction of crested wheatgrass would result in the establishment of a non-native plant species in the

WSA. Stumps from woodcutting activities would still be present which would slightly reduce naturalness in the 8,660 acres where this would occur.

Construction of 13 miles of fence would reduce naturalness on 13 acres subjected to surface disturbance and would visually influence 650 acres. In the long term, naturalness would be increased on 4,000 acres as a result of prescribed burning and improved livestock management. Woodcutting on 8,660 acres and brush control with seeding on 730 acres would reduce naturalness on 9,390 acres.

Naturalness would be improved through the construction of 15 miles of livestock water pipeline. Naturalness would be affected in the short term through soil disturbance and would be restricted to existing ways. In the long term, water hauling would be eliminated and there would be less of an impact on naturalness since trucks would no longer use the ways three times each week during the spring, summer or fall grazing seasons. The increase in the livestock forage allocation would reduce naturalness near water sources where there would be an increase in trampling.

Solitude

Continued vehicle use on 58.1 miles of ways and human activity associated with mineral exploration and development, range developments, prescribed burning of 4,000 acres and the 6,160-acre woodcutting area would cause repeated impairment of solitude opportunities adjacent to the activity. The reduction in western juniper through cutting, thinning and burning would reduce solitude on 12,660 acres through a loss of vegetative screening. Solitude opportunities would generally remain in the central portion of the WSA where volcanic basalt areas exist.

Primitive and Unconfined Recreation

Vehicle use would be limited to the existing 58.1 miles of ways and would continue to intrude upon primitive, non-motorized recreation opportunities in adjacent areas.

Mineral (sand/gravel) exploration and development, range developments and the 6,160 acre woodcutting area would intrude on primitive non-motorized recreation opportunities through surface disturbance and changes to the vegetative landscape. Mineral activities would also require 0.5 mile of additional vehicle road which would further impair primitive recreation opportunities.

Special Features

Vehicle use on existing ways would continue to disturb mule deer during the winter months and continue to provide access to and promote vandalism of cultural resources.

Conclusion: In the absence of wilderness designation, projected activities would both directly and indirectly impair wilderness values over approximately 15,000 acres of the WSA in the short term. In the long term, wilderness values would increase on 4,000 of these acres through ecosystem restoration as a result of improved management. In the long term, fencing, woodcutting, brush control with seeding, pipeline construction and mineral development would reduce naturalness on approximately 11,000 acres with further declines from other potential uses.

Impacts on Energy and Mineral Development

The entire WSA would be open to energy and mineral entry.

Energy Development

Exploration and development of energy resources would be allowed but none are projected in the WSA due to low potential.

Conclusion: No impacts to energy development are expected.

Mineral Development

Mineral entry would be allowed within the WSA. Development of one sand and gravel operation would be permitted.

Conclusion: Development of one projected sand and gravel operation would occur.

Impacts on Vegetation

Seral status of 8,660 acres would change from a predominately early seral juniper community toward a late seral sagebrush/bunchgrass community through juniper thinning and woodcutting. The dominate juniper overstory would be reduced and there would be a corresponding increase in understory grasses and forbs. For 730 acres of early seral sagebrush the vegetation would change to a seeded community dominated by crested wheatgrass. For 4,000 acres of early to mid-seral juniper and sagebrush, the vegetation would change toward late seral bunchgrass or sagebrush/bunchgrass communities through prescribed burning. The sagebrush, and to a lesser degree juniper, overstory would be removed and replaced by bunchgrasses and forbs. In all instances the herbaceous residual ground cover would increase and would compensate for an increase in vegetation removal through livestock grazing. Vegetation would be disturbed on 15 acres through the development of a sand and gravel operation. There would be no vegetation disturbance through pipeline construction since this would occur on existing ways. Fence construction would result in surface disturbance of 13 acres.

Conclusion: Seral status of 17,660 acres would change from early or mid-seral toward late seral. A total of 730 acres would change to seeded, non-native grass. Vegetation would be disturbed on a total of 28 acres.

Impacts on Wildlife

Wildlife habitat including crucial mule deer winter range would be moderately improved in the long term by prescribed burning of 4,000 acres to increase habitat diversity and forage which are both limited. Habitat disturbance would continue due to vehicle use on existing ways and mineral exploration and development. Overall habitat condition would improve as a result of juniper thinning and pipeline and fence construction to better manage livestock grazing. ODFW management goals would be exceeded. Mule deer populations would increase by 35 percent in the long term.

Conclusion: Wildlife habitat would be moderately improved by increased habitat diversity. Minor impacts would occur due to continued vehicle access and mineral exploration and development. Mule deer populations would increase by 35 percent in the long term.

Impacts on Livestock Grazing

Livestock use would increase by 200 AUMs as a result of 2,500 acres of juniper thinning, 730 acres of sagebrush control and seeding and the construction of 13 miles of management fence. The authorized use would increase from 1,100 AUMs to 1,300 AUMs in the short term. Water hauling would be eliminated as a result of the construction of 15 miles of pipeline. This would result in a decrease in expense to the livestock operators and a corresponding increase in convenience.

Conclusion: An additional 200 AUMs would be realized and there would be less expense and greater convenience to the livestock operators.

Impacts on Wood Products Harvest

Juniper harvest for firewood would occur on 6,160 acres through programmed woodcutting and on 2,500 acres through juniper thinning for livestock purposes. As a result, 150 cords per year would be harvested on the 6,160 acres and a total of 6,000 cords would be harvested from the 2,500-acre thinning. The long-term harvest would total 13,500 cords.

Conclusion: A total of 13,500 cords of juniper firewood would be realized in the long term.

Impacts on Recreation Use

Motorized recreation use would continue on 58.1 miles of ways within the WSA. Projected management activities including mineral development, prescribed burning, and fence and pipeline construction would reduce the naturalness of the area and have a slight adverse impact on non-motorized forms of recreation such as photography, sightseeing, hiking and hunting by introducing unnatural features on the landscape. There would be no change in the overall use level of the WSA.

Conclusion: The area's recreation use level of 10,000 visitor days per year would not be affected and would continue to increase at an annual rate of two to five percent.

Impacts on Local Personal Income

Livestock grazing would increase by 200 AUMs. Projected mineral development would amount to one sand and gravel pit with unknown economic value. Overall recreation use would remain at 10,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The toal effect on local personal income would be a net increase of $2,400 per year plus an unknown level of increase attributable to the projected mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $2,400.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action on the 32,070 acres recommended suitable for wilderness, surface-disturbing exploration and development for sand and gravel, as well as improved livestock and wildlife management resulting from the construction of 13 miles of fence, 15 miles of pipeline and 13,390 acres of vegetation manipulation would be foregone. A total of 200 AUMs of livestock forage on an annual basis and 13,500 cords of juniper firewood would be foregone in the long term.

For the 191 acres recommended nonsuitable for wilderness, vehicle use on 0.4 miles of ways would continue. No management activities are projected for this area.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action on the 32,070 acres recommended suitable for wilderness, most existing short-term uses would continue. There would be slight additional inconvenience and expense to livestock operators and a general elimination of motorized recreation from the area since motorized vehicles would be excluded. The long-term productivity of the wilderness values would be preserved.

For the 191 acres recommended nonsuitable for wilderness, all existing short-term uses of the area, including livestock grazing and vehicle use on 0.4 miles of way, would continue. Long-term productivity of wilderness values would be slightly reduced as a result of the continued presence of 0.4 miles of way.

Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitment of the wilderness resource or any other resource on the 32,030 acres designated as wilderness. There would be no irretrievable commitment of the existing wilderness resource in the area recommended nonsuitable since no activities which would irreversibly commit wilderness values are projected to occur in this 191-acre area.

5. Wilderness Manageability and Rationale for Selection of the Proposed Action

Manageability of the Area as Wilderness

The entire Badlands WSA is manageable as wilderness. There are factors, however, which could affect manageability of the area to a limited degree in the future. These include the maintenance and redevelopment of existing range projects and possible development or change in use of a 40-acre private inholding. This inholding is now used for livestock grazing and there has been no expressed interest in changing its use.

If the Badlands WSA was designated wilderness, existing range development projects, including fencing and ponds, could be maintained or reconstructed by mechanized equipment if: 1) needed to maintain current levels of livestock grazing; 2) if there were no practical alternatives and 3) if it conformed with BLM's Wilderness Management Policy.

Existing livestock grazing requires hauling water into the study area during the grazing season. Water hauling by vehicle and maintenance of facilities would adversely affect the manageability of the area as wilderness. However, wilderness values would not be seriously degraded because the dense juniper and the maze of lava ridges would prevent visitors from being aware of the activity on the ways even a short distance away.

Rationale for Selection of the Proposed Action

The proposed action is preferred because the area is generally free of signs of human activities and appears to have been affected primarily by the forces of nature. It is a manageable block of public land which allows essentially unrestricted movement throughout the area.

This alternative includes lands containing special features and outstanding opportunities for solitude or primitive and unconfined types of recreation. The 32,070-acre wilderness area would provide a unique wilderness opportunity because of the dense juniper cover and variety of basalt rock formations. The area is adjacent to U.S. Highway 20 (a major travel route), is near a population center (Bend) and is usable on a year-around basis.

The existing ways within this 32,070-acre area are substantially unnoticeable since topography and vegetation screen them from view. There are no activities occurring on the private inholding which impair the outstanding wilderness characteristics of the WSA.

The proposed action is a new alternative developed for the final wilderness EIS. During the public comment period for the draft wilderness EIS, strong public support was expressed for designation of the entire WSA. When the above factors were coupled with the wilderness values which exist in the area, it was determined that the value of the area for wilderness outweighed the value of the area for mineral potential, firewood cutting and motorized vehicle use and that all but 191 acres should be recommended as suitable for wilderness designation.

Three separate portions of the study area totaling 191 acres would be recommended as nonsuitable for wilderness designation.

Two narrow tracts of public land protruding from the northern boundary of the WSA would be recommended nonsuitable because they are surrounded on three sides by private land or offer limited opportunities for solitude and primitive recreation. A small area around and including Reynolds Pond would also be recommended nonsuitable for wilderness because of the reduced naturalness of the area. The Central Oregon Irrigation District constructed the pond and uses it as an irrigation waste water dump.

6. Summary and Analysis of Public Comments

The following is a summary of public comments specific to this WSA concerning the adequacy of analysis in this appendix and responses to those comments. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS.

Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analyses are addressed in the Statewide volume.

Comment: EIS fails to assess the impacts of Millican Valley ORV area on wilderness values. **Response:** No ORV events have been authorized in the portion of the Millican Valley ORV area located inside the Badlands WSA since it was classified as a WSA in 1980. The Brothers/LaPine Resource Management Plan has modified the 1978 decision to permit organized ORV events in this portion of the Badlands area. The boundary of the ORV area has been moved back so there is no longer any encroachment on the WSA.

Comment: Badlands WSA contains Sharptail grouse, sage grouse, pygmy owls and prairie falcons. **Response:** sharptail grouse are not known to occur in this part of Oregon. Sage grouse and pygmy owls are not known to occur in the Badlands area. Prairie falcons do occasionally use the Badlands area for hunting, however, their habitat is generally in cliffs and canyon areas like the Dry River Gorge to the east of the WSA.

Comment: The EIS fails to acknowledge the juniper - bitterbrush community which exists in the WSA. This community is under-represented in the NWPS. **Response:** See the Diversity in the National Wilderness Preservation System (NWPS) section of this appendix.

Table 1. Summary of Proposed Management Under Each Alternative, Badlands WSA (OR-5-21)

Proposed Management	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	32,221	32,030	20,727	0
Acres Closed to ORVs by Wilderness Designation[1]	32,221	32,030	20,727	0
Miles of Ways Closed	58.1	57.7	31.6	0
Miles of Road Constructed	0	0	0	0.5
Acres of Full Fee Estate Acquired[2]	0	40	40	0
Energy/Mineral Actions				
Acres withdrawn from mineral Location and Leasing by Wilderness Designation	32,221	32,070	20,767	0
Sand and gravel operations (number)	0	0	0	1
Non-structural Wildlife Projects Developed				
Brush control w/o seeding prescribed burning (acres)	0	0	0	4,000
Livestock Forage Increases (AUMs)	0	0	56	200
Structural Livestock Projects Developed				
Management fence (miles)	0	0	6	13
Pipeline (miles)	0	0	0	15
Nonstructural Livestock Projects Developed				
Brush Control with seeding (acres)	0	0	130	730
Juniper control w/o seeding (acres)	0	0	1,520	2,500
Wood Products Harvest Actions				
Acres available for juiper firewood	0	292	7,680	8,600
Juniper firewood harvested (cords0/50 years)	0	0	12,000	13,500

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[1] Except for 58.1 miles of ways in the WSA, most of the acreage shown is already closed to cross-country vehicle use through an existing "limited" ORV designation.

[2] Upon acquisition from willing landowners, this additional tract would be incorporated into the wilderness area, closed to vehicle use and withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Badlands WSA (OR-5-21)

Resource or Activity	All Wilderness	Proposed Action	Partial Wilderness	No Wilderness/No Action
Wilderness Values	Wilderness designation of 32,221 acres would protect and enhance existing wilderness values.	Wilderness designation of 32,070 acres, which includes acquisition of 40 acres of private land, would protect and enhance existing wilderness values. Limited wilderness values on 191 acres recommended nonsuitable would continue to be impaired by motor vehicle use.	Wilderness designation of 20,767 acres, which includes acquisition of 40 acres of private land, would protect and enhance existing wilderness values. Wilderness values on 11,494 acres recommended nonsuitable would be impacted by projected management actions that would both directly and indirectly impair 8,377 acres.	Projected management actions would impair the area's naturalness, solitude and primitive and unconfined recreation opportunities on more than 15,000 acres in the short term and 11,000 acres in the long term.
Energy and Mineral Development	Projected production from one sand and gravel operation would be foregone.	Projected production from one sand and gravel operation would be foregone.	Projected production from one sand and gravel operation would be foregone.	Projected production from one sand and gravel operation would occur.
Vegetation	Revegetation would occur on 42 acres.	Revegetation would occur on 41 acres.	Revegetation would occur on 18 acres. Seral status of 9,680 acres changed from early toward late seral stage through juniper thinning, woodcutting and livestock management. Crested wheatgrass established on 130 acres. Vegetation disturbed on six acres through other projected management actions.	Seral status of 17,660 acres changed from early toward late seral stage through juniper thinning, woodcutting and management. Crested wheatgrass established on 730 acres. Vegetation disturbed on 28 acres through other projected management actions.
Wildlife	Habitat slightly improved, resulting in a 20 to 25 percent increase in mule deer populations.	Habitat slightly improved, resulting in a 20 to 25 percent increase in mule deer populations.	Habitat slightly improved, resulting in a ten percent increase in mule deer populations.	Habitat moderately improved, resulting in a 35 percent increase in mule deer populations.
Livestock Grazing	Vehicle use precluded on 43.1 miles of ways. 200 AUMs foregone.	Vehicle use precluded on 42.7 miles of ways. 200 AUMs foregone.	Vehicle use precluded on 16.6 miles of ways. 56 additional AUMs realized; 144 AUMs foregone. Livestock distribution and management improved.	200 additional AUMs realized. Livestock distribution and management improved.
Wood Products Harvest	13,500 cords of firewood foregone.	13,500 cords of firewood foregone.	12,000 cords of firewood realized. 1,500 cords of firewood foregone.	13,500 cords of firewood realized.
Recreation Use	Visitor use decreased 60% in the short term and decreased 30% in the long term.	Visitor use decreased 60% in the short term and decreased 30% in the long term.	Visitor use maintained in the long term.	No impact
Local Personal Income	Annual local personal income would decrease by approximately $36,000.	Annual local personal income would decrease by approximately $36,000.	Annual personal income would increase by approximately $700.	Annual personal income would increase by $2,400.

Table 3. Classification of Energy and Mineral Potential, Badlands WSA (OR-5-21)

Commodity	Area	Level of Potential	Level of Certainty
Metals	Entire WSA	L	B
Diatomite	Entire WSA	L	B
Limestone	Entire WSA	L	B
Zeolites	Entire WSA	L	B
Bentonite	Entire WSA	L	B
Uranium/Thorium	Entire WSA	O	C
Geothermal	Entire WSA	L	C
Oil/Gas	Entire WSA	L	C
Sodium/Potassium	Entire WSA	L	B
Coal	Entire WSA	O	B
Tar Sands/Oil Shale	Entire WSA	O	B
Sand and Gravel	See Map 5	M	C
	Rest of WSA	L	C
Crushable Rock	Entire WSA	L	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

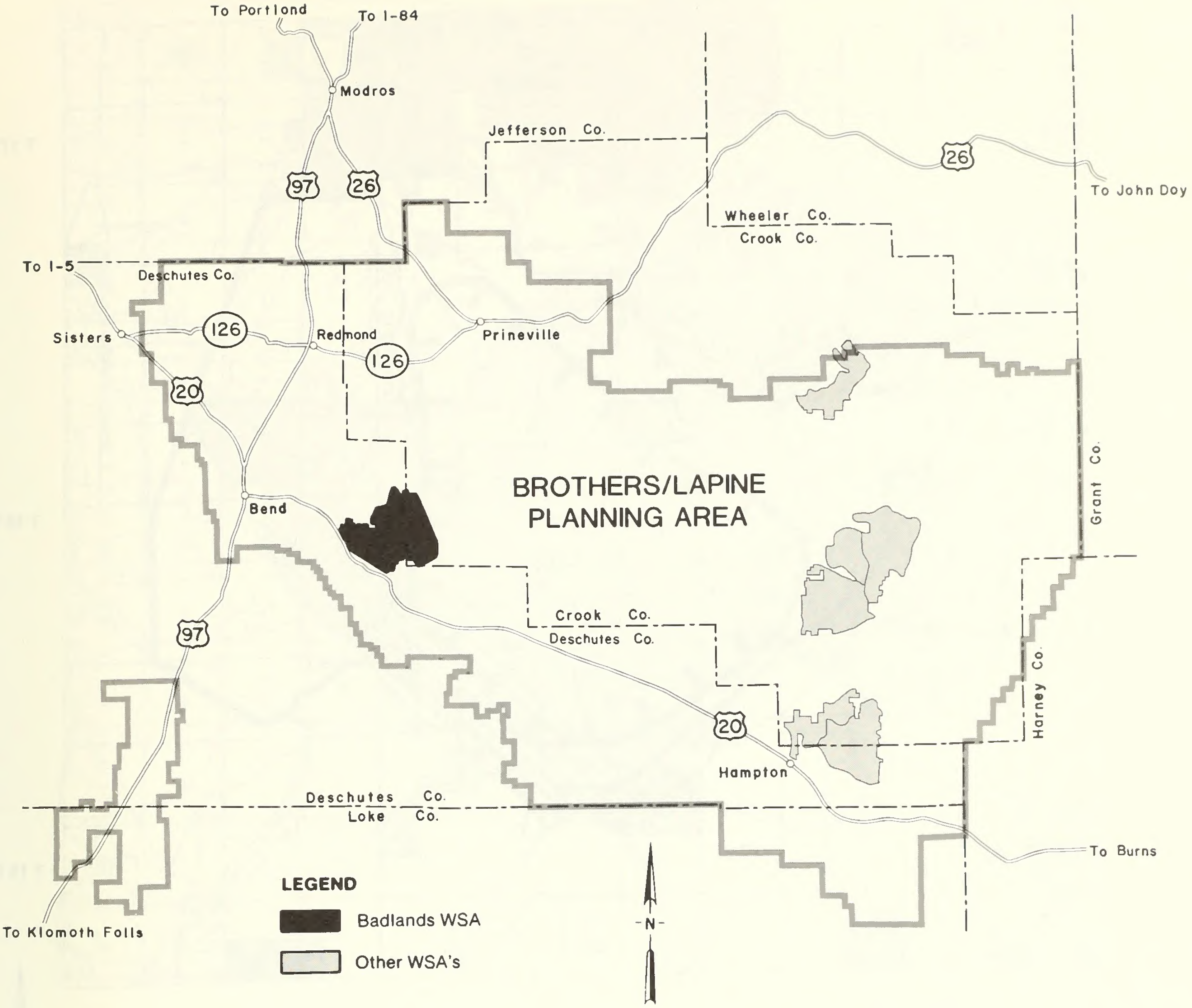
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

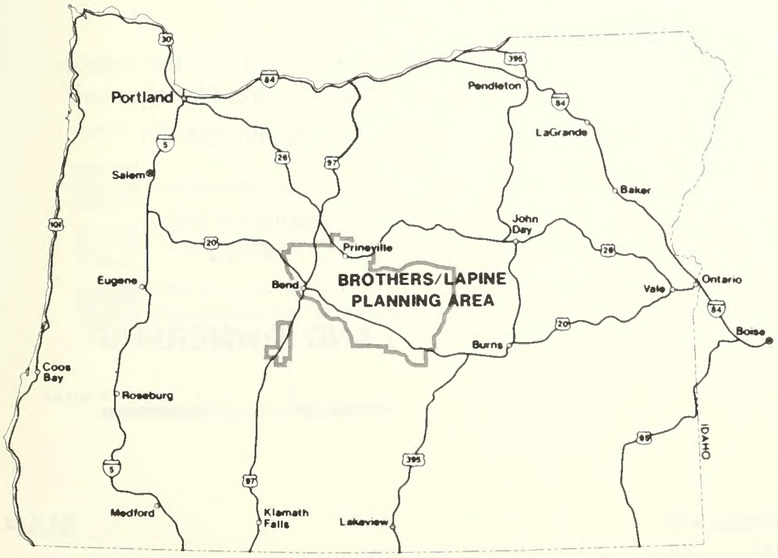
Table 4. Existing Livestock Use, Badlands WSA (OR-5-21)

Grazing Allotment	Licensed AUMs In Allotment	Period of Use	Percent of Allotment In WSA (AUMs)	Current Use Within WSA (AUMs)
Dodds Road (5206)	75	11/15 - 4/15	65	50
Lava Beds (5209)	508	4/15 - 11/15	93	470
Michaels (5207)	121	4/15 - 11/15	28	30
Millican (5212)	2,400	11/15 - 6/15	7	160
Rambo (5213)	605	11/15 - 6/15	55	300
Sinclair (5204)	30	4/15 - 11/15	100	30
Zell Pond (5108)	75	4/15 -11/15	80	60
Total	3,814			1,100

Table 5. Effects of Alternatives on Local Personal Income, Badlands WSA (OR-5-21) (1981 price levels)

Item	Unit of Measure	All Wildernsss	Proposed Action	Partial Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Livestock Grazing	AUMs	No change	No change	+56	+200
Energy & Mineral Development:					
Sand and Gravel Pit	Number	No change	No change	No change	+1
Recreation Use	RVD	-3,000	-3,000	No change	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES					
Livestock Grazing	$	No change	No change	+700	+2,400
Energy & Mineral Development:					
Sand and Gravel Pit	$	No change	No change	No change	Unknown
Recreation Use	$	-36,000	-36,000	No change	No change
Total	$	-36,000	-36,000	+700	+2,400





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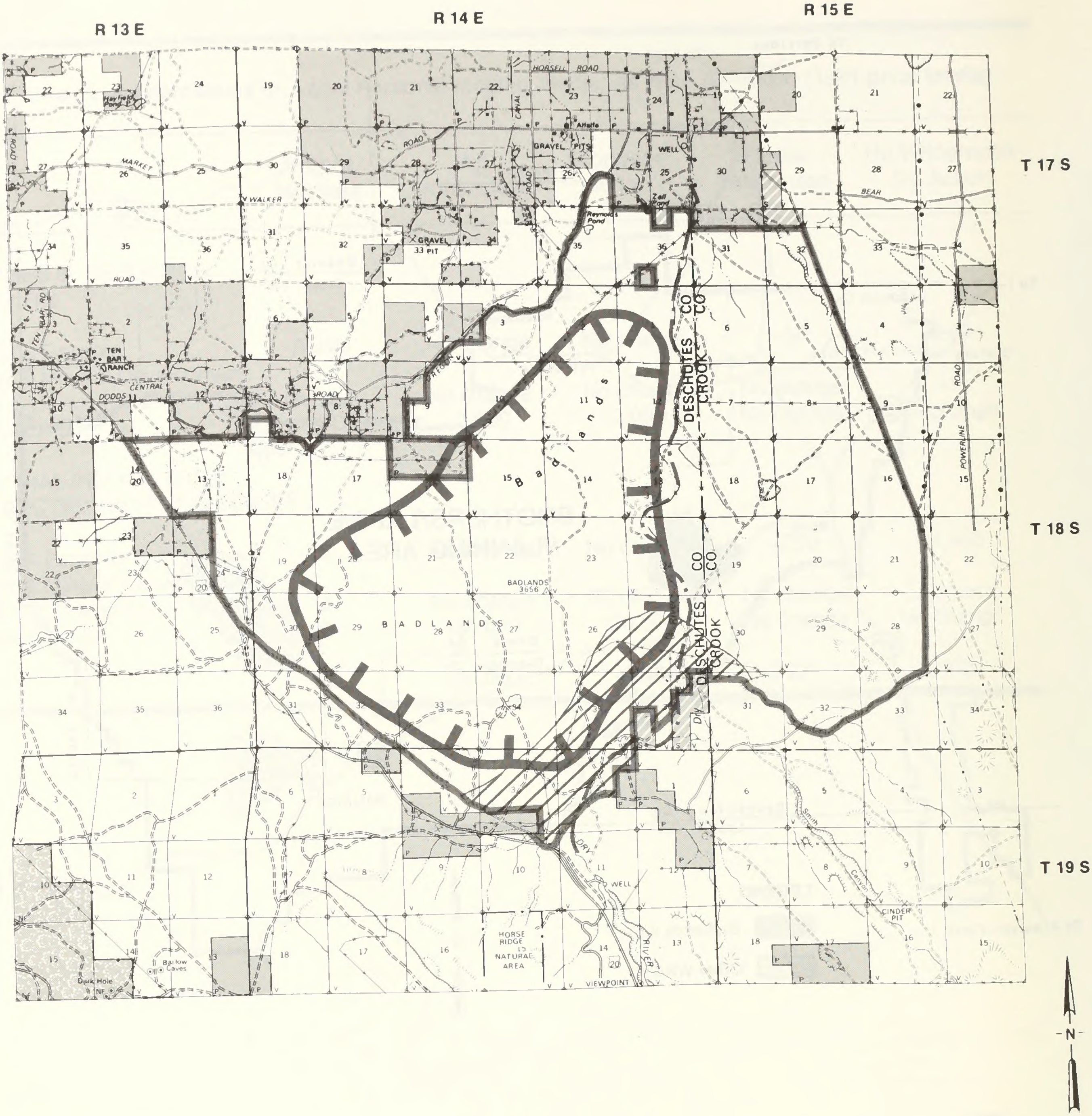
Badlands WSA
OR-5-21

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

▩ Private

░ U.S. Forest Service

▧ Crucial Mule Deer Winter Range

- — - Dry River - Prehistoric River Channel

┬┬ Geologic Values - Basalt Pressure Ridges with Unique Cryptogams (mosses, lichens)

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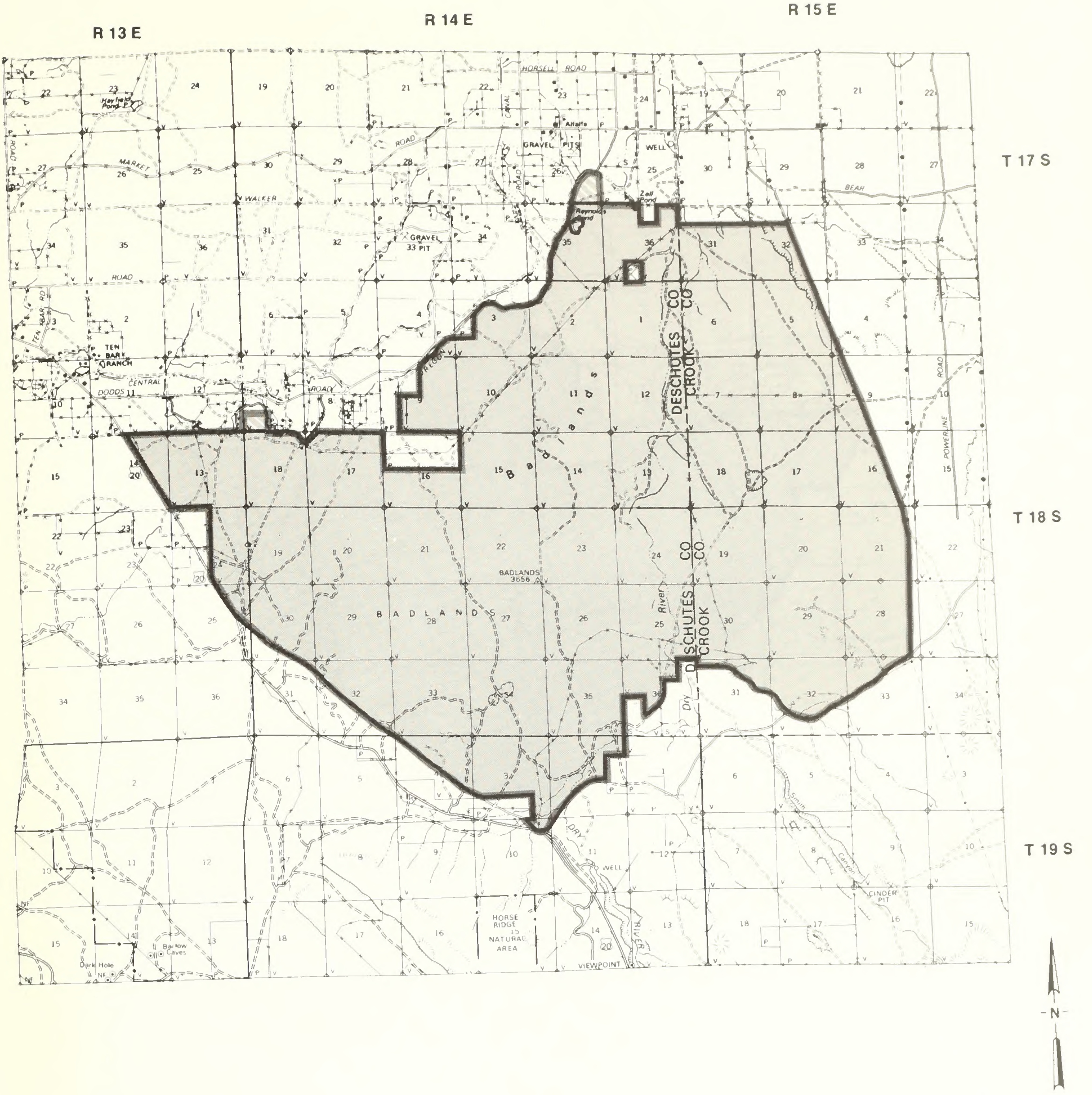
Badlands WSA
OR-5-21

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ **Wilderness Study Area Boundary**

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within
Recommended Wilderness

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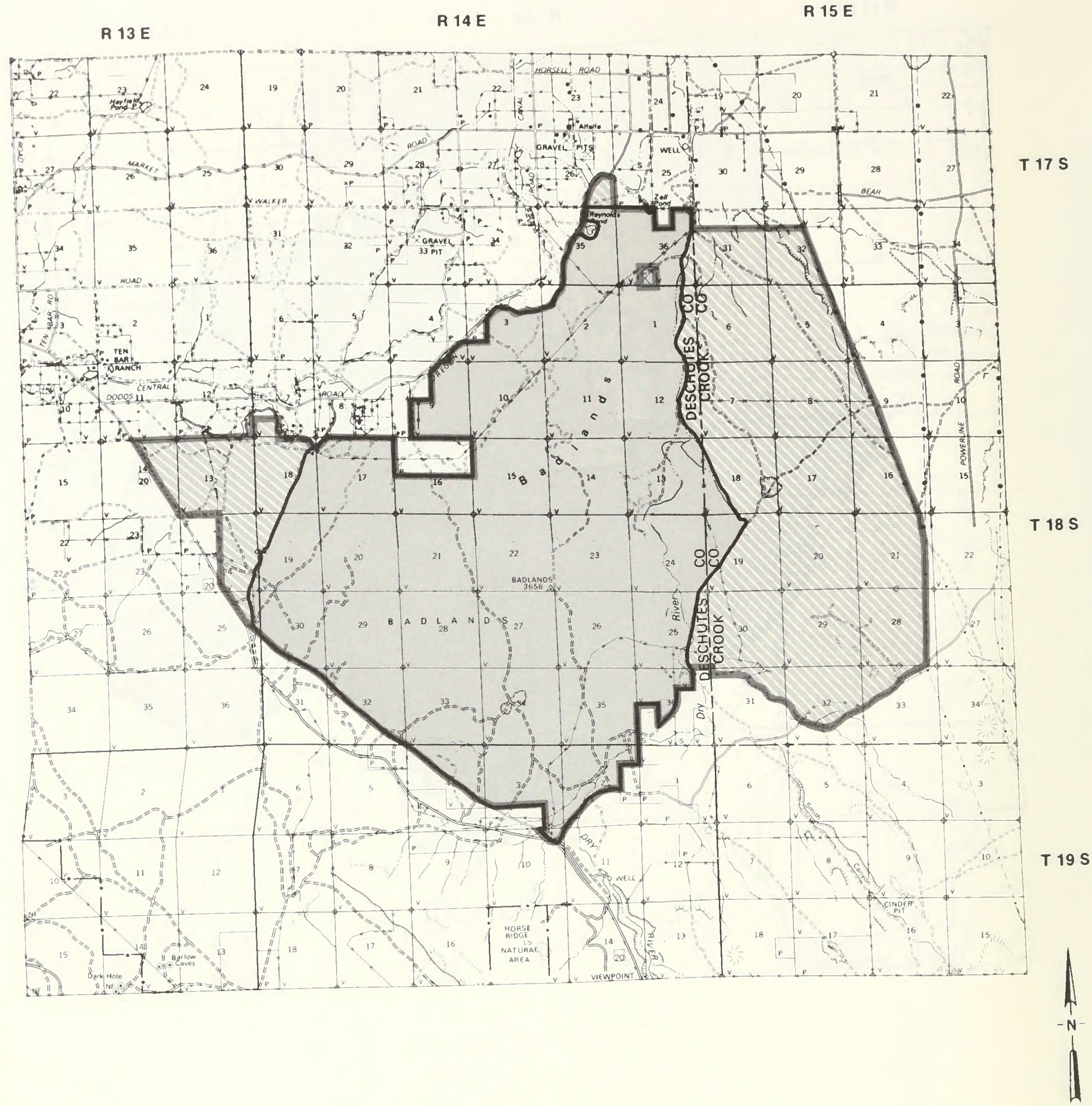
PROPOSED ACTION

1 0 1 2 MILES

MAP 3



▬ Wilderness Study Area Boundary

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

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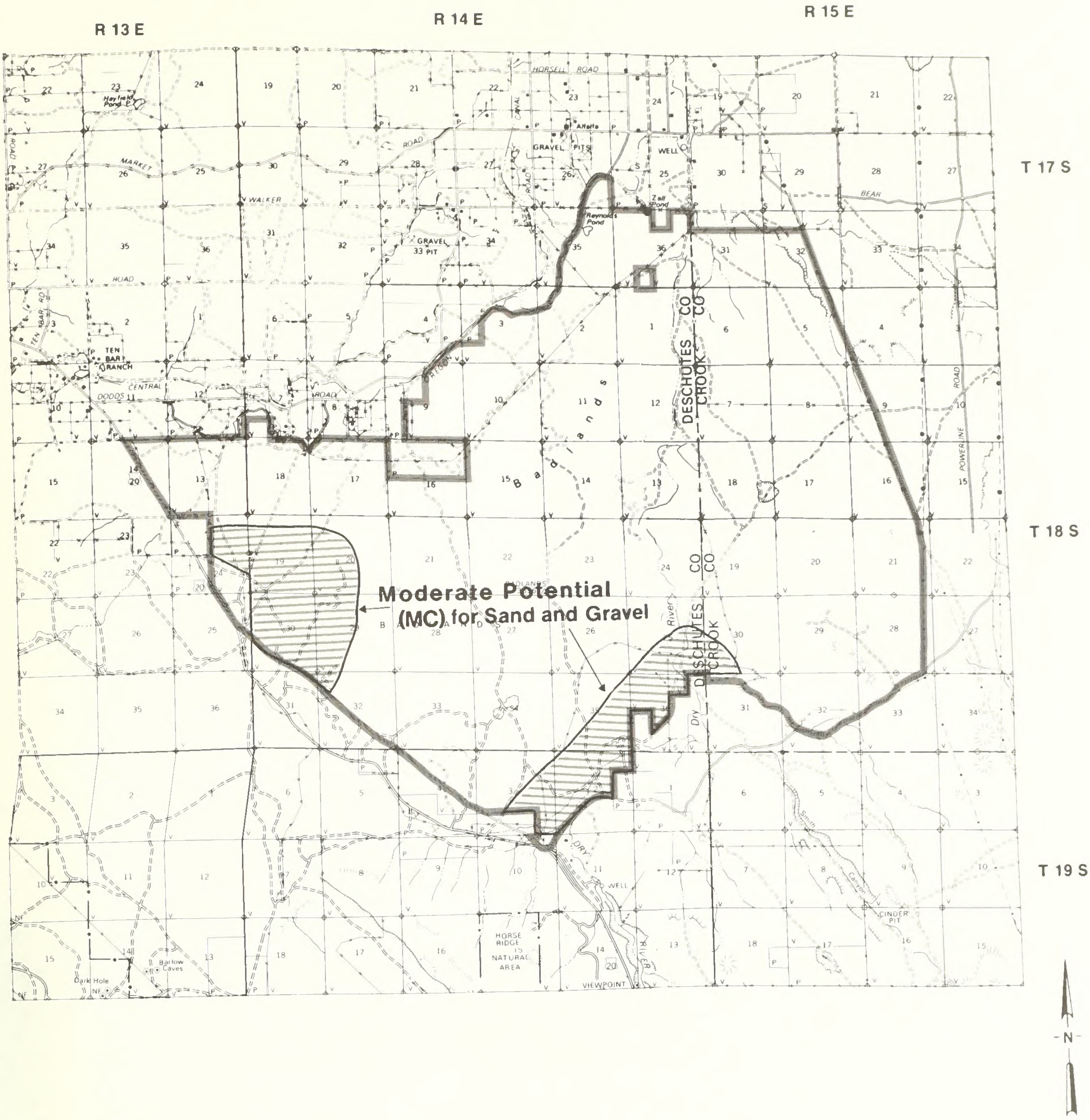
PARTIAL ALTERNATIVE

MAP 4



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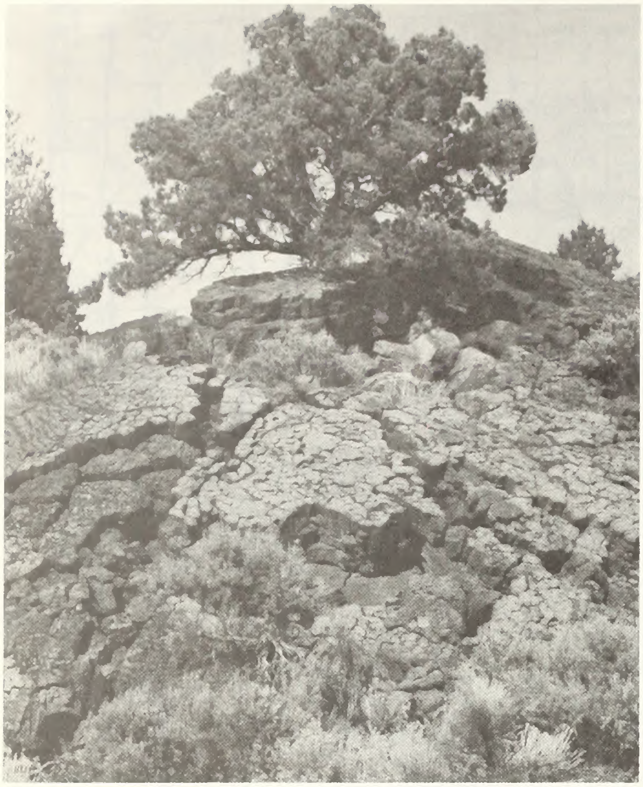
Badlands WSA
OR-5-21

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

MAP 5



Badlands WSA, OR-5-21. In the central portion of the WSA. Within area recommended suitable under the proposed action and partial alternatives.

Badlands WSA, OR-5-21. Looking east into the east-central portion of the Badlands (background is outside of the WSA). The foreground area is suitable under the proposed action and partial alternatives. Illustrates juniper trees and open, sandy areas. May 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

North Fork Wilderness Study Area (OR-5-31)

1. Introduction

General Description of Study Area

The North Fork Wilderness Study Area (WSA) is located in Crook County, approximately 70 miles northeast of Bend, Oregon (see Map 1). It is about 200 miles southeast of Portland, Oregon. The area is 5 miles north of the Prineville-Paulina Highway.

The study area is irregularly shaped, curving along 12.5 miles of the North Fork of the Crooked River. It contains 12,110 acres of BLM-administered public land and National Forest land (see Map 2). The BLM-administered land includes 240 acres of split estate. There are 480 acres of private inholdings located near the northern boundary. The WSA is surrounded by public, private and National Forest land. The western boundary of the WSA is formed by high standard gravel and bladed BLM and USFS maintained roads. The eastern and northern boundaries are formed by low standard or bladed dirt roads and private property. The southern boundary is formed by a road and private property. Two dead-end roads totaling 1 mile in length enter the study area, forming part of the boundary.

The main feature of the WSA is the 800 to 900-foot-deep, vertical-walled canyon on the North Fork of the Crooked River. There are steeply-sloped, rolling hills to the east and west of the canyon.

Vegetative communities range from ponderosa pine and grass in the drainages to low sagebrush and bunchgrass on the rockier areas.

The North Fork of the Crooked River is the most noteworthy water source in the WSA. Other water sources include Fox Canyon Creek and Committee Creek, both tributaries of the North Fork, and numerous springs, seeps and smaller perennial streams.

The North Fork is a tributary of the Crooked River and has an average annual flow of 123 cubic feet per second and an average annual yield of 90,000 acre feet. Overall water quality meets State water quality standards.

Interrelationships

The North Fork WSA includes 1,125 acres administered by the U.S. Forest Service that were inventoried jointly by BLM and USFS and determined to possess wilderness values. The draft forest plan (1988) for the Ochoco National Forest identifies this area for further study by BLM for possible designation as wilderness.

The entire WSA falls within lands ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. This treaty reserved rights for hunting, fishing and gathering in usual and accustomed places and grazing livestock on unclaimed land.

A 12.5-mile portion of the North Fork of the Crooked River flowing through the WSA was designated by Congress as a component of the National Wild and Scenic Rivers System in 1988. Of this, 11.1 miles of river were classified as wild with the remaining 1.4 miles of river classified as scenic. The wild river classification withdraws from mineral location and leasing all public lands within 0.25 mile on each side of the river. An additional 19.7 miles of the North Fork of the Crooked River located upstream on the Ochoco National Forest and downstream from the WSA were also designated as components of the National Wild and Scenic Rivers system.

The WSA is located in the Oregon Department of Fish and Wildlife's (ODFW) Ochoco Wildlife Unit and supports approximately 700 mule deer and 200 elk in the winter, and 170 mule deer, 20 antelope and 30 elk in the summer. At present all big-game animals are at management objective levels. The management objective for nongame wildlife is to maintain populations of naturally occurring species at self-sustaining levels. One introduced species, the chukar partridge, will also be managed at self-sustaining levels. The northern bald eagle is a winter resident in the WSA and one nocturnal roost is known to occur. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

Crook County has not identified any conflicts between the proposed action and the county comprehensive plan.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review processes. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impacts on the area's wilderness values,
- impacts on energy and mineral development,
- impacts on crucial winter range for deer and elk and populations of antelope, bald eagles and other wildlife species,
- impacts on recreation use levels, and
- impacts on grazing use levels and management.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State, and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the BLM Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (proposed action)

A partial alternative which would recommend part of the WSA as suitable for wilderness is not analyzed because there is no feasible opportunity to resolve resource or manageability conflicts by reducing the size of the WSA and still retain necessary wilderness qualities.

All Wilderness

Under the all wilderness alternative, all 12,110 acres of public land (including national forest land) in the WSA would be recommended as suitable for wilderness designation (see Map 2). The western and eastern boundaries would be formed by bladed high standard and low standard dirt roads. The northern boundary would be formed by private property and low standard bladed roads. The southern boundary would be formed by a bladed high standard road and private property. For purposes of analysis, it is assumed the 480 acres of private inholdings and mineral estate of the 240 acres of split-estate land would not be acquired.

Two dead-end roads totaling 1 mile in length would remain open to vehicle travel. These road segments are used primarily by ranchers for livestock supervision and by recreationists for hunting and fishing access. A total of 22 miles of ways would be closed.

Energy and Mineral Development Actions

Wilderness designation would close an additional 8,318 acres within the WSA to energy and mineral entry.

The 240 acres of split-estate lands within the WSA have high potential for the occurrence of oil and gas, and exploration would be possible. However, in the absence of known oil and gas deposits, development is not anticipated.

Approximately 200 acres of the 240-acre split-estate parcel have a moderate potential for the occurrence of bentonite and zeolites. Exploration for these industrial minerals would be allowed but due to the existence of more readily available deposits elsewhere, development is not expected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with BLM's Wilderness Management Policy. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Prescribed burning is proposed on 1,000 acres of sagebrush and juniper vegetation to maintain fire-dependent ecosystems. This burning would involve several small, scattered areas. Due to safety concerns and high resource values (timber) on lands adjacent to the WSA, wildfires are fought aggressively within the WSA. These acres would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

Livestock use would remain at the current level of 535 AUMs within portions of the four grazing allotments in the WSA. The season of use would remain as shown in Table 4. Vehicle use would be precluded on 22 miles of ways. Management of livestock and maintenance of 9.5 miles of fence and two spring developments would be conducted primarily on horseback. Mechanized heavy equipment would be used, subject to permit, once every 10 to 15 years to maintain three reservoirs.

Wood Products Harvest Actions

Designation of 12,110 acres as wilderness would preclude timber harvest activities, including salvage timber harvest and overstory removal on the 2,176 acres of commercial forestland in the WSA.

Recreation Management Actions

Except for 1 mile of roads, the entire 12,110 acres in the North Fork WSA would be closed to motorized vehicle use. A total of 22 miles of ways would be closed. Presently, vehicle use is limited to the roads and ways within the WSA through an ORV designation. Current recreation use is estimated to be 3,000 visitor days per year, primarily for fishing in the North Fork of the Crooked River, May through October, and hunting for deer and elk in October and November.

Enhanced Wilderness

Under the enhanced wilderness alternative, all 12,110 acres of the WSA would be recommended suitable for wilderness designation (see Map 3). The western boundary would be formed by a high standard gravel road, the eastern and northern boundaries by low standard and bladed dirt roads and private land and the southern boundary by a bladed high standard road and private land. An attempt would be made to acquire the 480 acres of private inholdings and the 240 acres of mineral estate through purchase or exchange with willing owners.

Assuming acquisition of these lands, the total area recommended suitable under this alternative would be 12,590 acres. The two dead-end roads totaling 1 mile and 22 miles of ways would be closed.

Energy and Mineral Development Actions

Wilderness designation would close an additional 9,038 acres to energy and mineral entry, assuming acquisition of 480 acres of private land and 240 acres of mineral estate. Surface-disturbing exploration and development of oil and gas and industrial minerals would be prohibited in the entire WSA.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with the BLM's Wilderness Management Policy. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Prescribed burning is proposed on 1,000 acres of juniper and sagebrush to maintain fire-dependent ecosystems. This burning would involve several small, scattered areas. Due to safety concerns and high resource values (timber) on lands adjacent to the

WSA, wildfires are fought aggressively within the WSA. These acres would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

Livestock use would remain at the current level of 535 AUMs within portions of four grazing allotments. The season of use would remain as depicted in Table 4. Vehicle use would be precluded on 22 miles of ways and on two dead-end roads totaling 1 mile. Management of livestock and maintenance of 9.5 miles of fence and two spring developments would be conducted mainly on horseback. Mechanized heavy equipment would be used, subject to permit, once every 10 to 15 years to maintain three reservoirs.

Wood Products Harvest Actions

Designation of 12,590 acres as wilderness would preclude timber harvest activities, including salvage timber harvest and overstory removal on the 2,176 acres of commercial forestland in the WSA.

Recreation Management Actions

The entire North Fork WSA, consisting of 12,590 acres (assuming acquisition of the private land), would be closed to motorized vehicle use. A total of 22 miles of ways and 1 mile of road would be closed. Vehicle use is presently limited to these ways and roads within the WSA through an ORV designation. Current recreation use is estimated to be 3,000 visitor days per year, primarily for fishing in the North Fork of the Crooked River, May through October, and hunting in October and November.

No Wilderness/No Action (Proposed Action)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

A total of 8,558 acres of the WSA would be open to energy and mineral entry. A total of 3,552 acres are already withdrawn due to designation of the area as a National Wild and Scenic River and 11.1 miles of the river being classified as "wild".

Exploration for oil and gas, which have a high potential for occurring in the WSA, would initially be conducted with seismic surveys. Further exploration is projected to involve drilling one test exploration well which would require construction of a drill pad, mud pits and 0.5 mile of access road. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. Three additional wells would be anticipated which would require 2 miles of access roads. Approximately 3 miles of pipeline would be constructed in the WSA to market the gas. Total surface disturbance would be 15 acres in the WSA.

Approximately 1,160 acres of the WSA have moderate potential for industrial minerals. Exploration is projected to consist of surface sampling with trenching. These tests would disturb two acres. Due to more accessible deposits elsewhere in the general area, no development of deposits within the WSA is projected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Prescribed burning is proposed on 4,000 acres of juniper and sagebrush to maintain fire-dependent ecosystems. The burns would be scattered over several parts of the area. Due to high resource values (timber) adjacent to the WSA, wildfires are fought aggressively within the WSA. These acres would replace those acres which would not be allowed to burn naturally.

Livestock Management Actions

The authorized livestock use in the WSA would increase by 76 AUMs, from 535 AUMs to 611 AUMs, as a result of forage made available through the development of one reservoir and one spring. Construction of 1.5 miles of livestock trail would facilitate livestock movement in and out of the North Fork Canyon. This would disturb one acre within the WSA.

Wood Products Harvest Actions

A total of 2,176 acres would be available for salvage and overstory timber harvest within the WSA. Overstory harvest on 66 acres on National Forest lands would yield approximately 60 thousand board feet (60 Mbf) per year or a total of three million board feet (3 MMbf) over the next 50-year cutting cycle. The remaining 2,110 acres of commercial forestland would be managed on a salvage-only basis with an approximate annual harvest of 11 thousand board feet (11 Mbf) or a total of 550 Mbf over the next 50-year cutting cycle.

Recreation Management Actions

Vehicle use would continue to be limited to 22 miles of ways and on two dead-end roads totaling 1 mile. The current recreation use is estimated at 3,000 visitor days per year, primarily for fishing, hunting, hiking, sightseeing and camping.

Summary

Table 1 summarizes the projected management actions in the WSA under each alternative.
Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

Introduction

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Although most of the area appears to be in a natural condition, there are a significant number of unnatural features scattered throughout most portions of the WSA. Twenty-six unnatural interior features influence approximately 1,200 acres (ten percent of the WSA). These unnatural features are primarily on the eastern and western plateaus of the North Fork of the Crooked River Canyon and within some of the tributary side canyons including Fox Creek and Indian Trail Creek Canyons. The majority of the canyon remains generally unaffected by human activity.

Unnatural features in the North Fork WSA include 9.5 miles of fence, 3 reservoirs, 2 spring developments, a 113-acre seeding (orchard grass and crested wheatgrass), 120 acres of precommercially-thinned timber, 66 acres of a 15-year-old timber harvest area, 22 miles of ways and 1 mile of dead-end roads. Continued vehicle use on these ways and roads are causing them to remain in an unnatural appearance. While some ways are reverting to a natural appearance, others extend down steep slopes which have caused erosion channels to form. This has adversely affected the scenic qualities of some areas by creating visual contrasts not in harmony with the natural setting, especially in the Lower Falls area.

Unnatural features outside the WSA that adversely affect the area's naturalness include boundary roads, livestock reservoir and spring developments, fences and areas of timber harvest.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The North Fork WSA has outstanding opportunities for solitude due to vegetative screening and excellent topographic screening. However, these opportunities are limited primarily to small areas in the side canyons of the North Fork of the Crooked River and in the main canyon of the North Fork itself.

The forested areas and steep canyon lands of the WSA provide outstanding opportunities for several different types of primitive recreation. Hiking, camping, sightseeing and fishing are available within portions of the North Fork WSA. Floating the river is becoming an increasingly popular form of primitive recreation during the spring when the water levels are adequate. There are also opportunities for hunting, photography and observing wildlife. During the winter months, snowshoeing and cross-country skiing are also available, depending on snow conditions. The ruggedness and physical challenge of terrain and the geology of the narrow, deep Crooked River Canyon twisting through approximately 12.5 miles of the WSA (1.75 miles of this total is on private land) enhance the quality of these recreational activities.

These opportunities are limited by two private inholdings in the Crooked River Canyon. The inholdings are located in the canyon. They restrict freedom of movement because the canyon is the main area of use and primary travel corridor for the WSA and visitors must trespass on private land to be able to move through the area. The rugged terrain of the Crooked River Canyon, along with the size and shape of the WSA, make it highly unlikely that the average visitor would hike around these private inholdings.

Special Features

The area's special wilderness features include scenic and zoological values. Although not unique geologically, the North Fork of the Crooked River Canyon is very scenic. Winding about 12.5 miles through the middle of this WSA, it was created by the erosive action of the North Fork of the Crooked River. The depth of this vertical-walled canyon varies, with some portions being exposed to a depth of 800 to 900 feet. It generally ranges from 300 to 500 feet. The canyon of the North Fork is an excellent example of how the forces of nature have cut a narrow, winding, secluded canyon with steep sideslopes and cliffs in a high desert plateau. A waterfall on private land, Upper Falls, and Lower Falls located on public land adds to the scenic qualities of the area (see Map 5).

Areas in the southern and western parts of the WSA have been geologically mapped as John Day Formation, which is famous for its significant vertebrate and plant fossils. No localities have been recorded in the WSA.

A trail of prehistoric or early historic age has been reported in the northern portion of the WSA.

In addition to the more common wildlife species such as mule deer and antelope, Rocky Mountain elk and various raptors also inhabit the WSA. The WSA contains crucial winter range for deer and elk. The northern bald eagle, Federally-listed as threatened in Oregon, is a winter resident of the area and a roost site has been documented. Populations of rainbow trout, smallmouth bass, brown bullhead, leopard and speckled dace, sculpin and other fish species are also present.

Portions of Rough Canyon and Fox Canyon Creeks contain riparian vegetation in potential natural condition. In addition, a plant species of special interest, *Calochortus longebarbatus var. peckii,* is suspected to occur in the WSA. (See the Vegetation section.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the North Fork WSA is located in the Rocky Mountain Forest and Intermountain Sagebrush Provinces and the potential natural vegetation is the western ponderosa forest and sagebrush steppe with juniper. Of the vegetative communities listed in the Ochoco-Blue-Wallowa Mountain section of the Oregon Natural heritage Plan, the WSA contains western juniper/bluebunch wheatgrass, western juniper/rigid sagebrush/Sandberg's bluegrass, ponderosa pine/bunchgrass, rigid sagebrush scabland and rigid sagebrush/bunchgrass.

There are seven standard metropolitan statistical areas over 100,000 population within five hours' driving time of the North Fork WSA: Medford, Eugene/Springfield, Portland, and Salem, Oregon; Richland/Kennewick/Pasco and Yakima, Washington; and Boise, Idaho.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by geologists with TERRADATA, a consulting firm under contract with BLM. Technical details of the findings of the evaluation are found in a TERRADATA report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, North Fork Crooked River Geologic Resource Area." This report is supplemented by a BLM evaluation of the same area.

The WSA is within the North Fork Crooked River geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide Wilderness EIS volume.

A total of 3,552 acres within 0.25 mile of the North Fork of the Crooked River was withdrawn from mineral entry with the designation of the North Fork as a component of the National Wild and Scenic Rivers system and 11.1 miles of the river being classified as wild.

Table 3 shows the energy and mineral potential classifications for the WSA. Map 4 shows where energy and mineral resources have moderate and high potential for occurrence in the WSA. The WSA is within an area of critical mineral potential (ACMP) for oil and gas.

The exposed rocks in the WSA are Tertiary and Quaternary volcanics and volcaniclastic sediments. The subsurface rocks are inferred from oil and gas exploration wells to included Cretaceous marine clastic sediments and pre-Cretaceous marine sediments and metamorphosed sediments. Depth to these sediments varies from 1,500 to 2,500 feet.

Energy Resources

Oil and gas has a high potential for occurrence based on several positive factors. Several deep exploratory wells have been drilled near the WSA and all had oil and gas shows, indicating that marine clastic sediments are probably present beneath the WSA. The combination of surface structure, subsurface geology, hydrocarbon shows and persistent exploration all lead to a high potential rating for oil and gas in the WSA.

As of October 16, 1987, approximately 2,040 acres within the WSA were leased for oil and gas. There were no geothermal or coal leases within the WSA.

Mineral Resources

Bentonite and zeolites are suspected of occurring in the southwestern portion of the WSA; however, the actual extent of these deposits are not known. The area has a moderate rating for these industrial minerals. As of October 16, 1987, no mining claims were filed in the WSA.

Vegetation

The WSA is primarily a transition zone between drier, lower elevation grasslands and the wetter, higher elevation coniferous forest, and as such exhibits significant diversity of vegetation. In the western part of the WSA rocky biscuit-scabland ridges with low sagebrush and Sandberg's bluegrass are separated by steep drainages leading to the river canyon. The north slopes of these drainages consist of ponderosa pine/Douglas fir/pinegrass with the south slopes dominated by western juniper/bluebunch wheatgrass. The North Fork of the Crooked River and other riparian areas consist of grasses, rushes, dogwood and willow. The area east of the North Fork rim is primarily an open, rocky table with low sagebrush/ Idaho fescue communities and islands of western juniper. The extreme north part of the WSA is ponderosa pine forest. Vegetation communities in the WSA are primarily in mid-seral ecological status.

Two exceptions are portions of Fox Canyon and Rough Canyon creeks which are in potential natural community (PNC) condition. These streams represent aquatic cell No. 2 (first to third order stream system originating in Ponderosa pine zone) and terrestrial cell No. 28 (willow communities in riparian areas) as identified in the Oregon Natural Heritage Plan for the High Lava Plains, Columbia Basin Province. The steep, rocky canyon walls protect these communities which consist primarily of alder, willows, currant and red-osier dogwood. Eighty percent of the riparian vegetation in the WSA is in late seral or PNC status.

No threatened or endangered plants are known to exist in the WSA. However, one Federal candidate species, Peck's long-bearded mariposa lily *(Calochortus longebarbatus var. peckii)* is suspected of occurring. Another plant of State concern, the umbellata spring beauty *(Claytonia umbellata)* is known to occur in the WSA.

Wildlife

A representative sampling of wildlife species occurring in this WSA includes Rocky Mountain elk, mule deer, antelope, golden eagles, prairie falcons, Canada geese, bobcat, Lewis' woodpecker, California quail, chukar and the western rattlesnake. Approximately 700 mule deer and 200 elk occupy the WSA in the winter months while 170 mule deer, 30 elk and 10 antelope are summer residents. The northern bald eagle which is Federally listed as threatened in Oregon is a winter resident in the WSA. A nocturnal roost is documented in the WSA and there are reports of bald eagles in the WSA in the summer months. Goshawk nests have been found north and east of the area and are likely to occur in the stringers of timber in the WSA as well. The WSA is considered crucial winter range for deer and elk. Wildlife habitat is generally in good condition but lacks diversity. Stream riparian habitat totals approximately 60 acres with 80 percent in excellent or good condition for wildlife. Rainbow trout are found in all perennial streams while brown bullhead and smallmouth bass are found only in a portion of the North Fork of the Crooked River.

Watershed

The watershed of the WSA is characterized by steep drainages leading to the river canyon. Within the WSA there are 12.5 miles of the North Fork of the Crooked River. Approximately 1.75 miles of the river are within private inholdings. Situated in a rocky canyon which is basalt in nature, the stream bed is quite rocky, often with little or no riparian areas. A stream channel survey of the North Fork of the Crooked River indicated that overall channel conditions were good. Another 4.75 miles of perennial stream are located in the WSA including portions of Committee, Rough Canyon, Hail and Fox Canyon creeks. The upland watershed conditions are mostly good.

Livestock Grazing

Portions of four grazing allotments are in the WSA and Table 4 summarizes the current livestock use.

Existing livestock developments include 9.5 miles of fence, 2 spring developments, 3 reservoirs and a 113-acre orchard grass/crested wheatgrass seeding.

The 22 miles of way and 1 mile of road in the WSA are used by livestock operators primarily for general livestock supervision and inspection and repair of fences and springs. Most of the everyday livestock work requires horses due to the lack of vehicular access into much of the WSA and the steep, rocky topography. Livestock operators make a total of 20 to 25 trips per year by vehicle into the WSA for livestock management purposes.

Wood Products Harvest

Approximately 2,176 acres of commercial forestland have been identified within the North Fork WSA with a total estimated volume of 15 million board feet (15+MMbf). Ponderosa pine is the primary species, although Douglas fir and white fir sometimes predominate on the northern exposures of the drainages.

This commercial forestland is managed on a custodial basis with wildlife, scenery and watershed concerns overriding timber harvest. Overmature, dying and diseased trees on 2,110 acres may be harvested periodically under salvage sales using existing roads and ways. An estimated five board feet per acre is available annually on this custodial basis. In the long term (50 years), this would amount to approximately 550 thousand board feet (550 Mbf).

Overstory removal on a 30 to 40-year entry schedule is applied to 66 acres of commercial forestland located along Fox Canyon and Indian Trail creeks on the Ochoco National Forest. Average annual harvest volumes are approximately 60 Mbf. The last entry occurred nearly 20 years ago. During the next 50 years it would be expected that three MMbf would be harvested from this area.

Recreation Use

Recreation use in the WSA includes camping, hiking, hunting for deer and elk, fishing in the North Fork of the Crooked River, sightseeing, bird watching and limited float boating in the early spring. There is legal vehicle access along the north and west sides of the WSA. Numerous ways which run out ridges to the canyon rim and go into old timber sale areas originate from the western boundary road. These ways are used heavily by both anglers and hunters. Vehicle access from the south and east is limited by private land. Overall recreation use in the WSA is estimated to be 3,000 visitor days per year and is currently increasing at a rate of approximately three percent per year.

Local Personal Income

Livestock use at the current level of 535 AUMs, salvage timber harvest of an average annual volume of 70 Mbf and recreation use totaling 3,000 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $6,400 for livestock grazing, $18,900 for timber production and $36,000 related to recreation use of the WSA, for an overall total of $61,300. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 12,110 acres
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness and wilderness values within the entire 12,110 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features, including riparian areas, scenic qualities within the North Fork of the Crooked River Canyon, wildlife species, cultural values and sensitive plant species would also be protected.

Naturalness

The naturalness of the area's undisturbed canyons and plateaus would be enhanced by prohibiting motorized vehicle use. Closure of 22 miles of ways which influence approximately 600 acres (approximately five percent of the WSA) would allow these ways to begin to revegetate within two to three years, and become less noticeable. Use of these ways would continue by heavy equipment once every 10 to 15 years to maintain livestock reservoirs. However, this level of use would still allow revegetation.

Prescribed burning of 1,000 acres would be noticeable in the short term. In the long term, naturalness would be improved through restoration of a fire-dependent ecosystem.

Solitude

Existing opportunities for solitude provided by the area's size and 10.75 miles of winding canyon on public land would be enhanced by eliminating motor vehicles on 22 miles of ways. Vehicles would be limited to the boundary roads and the 1 mile of dead-end roads. This reduction in vehicle access would provide a large core area for visitors to hike into and experience solitude with limited or no disturbance from vehicles. Solitude would remain limited in the northern part of the WSA due to the proximity of the boundary roads to the study area.

Primitive and Unconfined Recreation

Closure of 22 miles of ways to motorized vehicle use would increase opportunities for primitive and unconfined recreation opportunities such as hiking, fishing, photography, observing wildlife and hunting. The quality of these experiences would also improve by removing vehicles and by allowing the ways to revegetate. A more natural and primitive setting would be provided.

Special Features

Eliminating motorized vehicle use on 22 miles of ways would reduce impacts to special features by reducing soil compaction and erosion (especially on steep slopes of some tributary side canyons), and by eliminating minor seasonal disturbance to elk, mule deer, antelope and wintering bald eagles.

Conclusion: Wilderness designation of the entire 12,110 acres within the North Fork WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 8,318 acres within the WSA to energy and mineral entry, making the total mineral withdrawal for the WSA 11,870 acres. (There are 3,552 acres within the WSA that are already withdrawn from mineral entry through Congressional designation of the area as a wild and scenic river.) The 240 acres of split-estate and the 480 acres of private land in the WSA would be open to energy and mineral exploration.

Energy Development

Surface-disturbing exploration and development of oil and gas in the WSA would be prohibited on 11,870 acres (3,552 already withdrawn plus 8,318 additional withdrawal with wilderness designation of the WSA). Projected development of four production wells would be precluded. Exploration could occur on the 240 acres of split-estate and 480 acres of private land but development on this land would not be expected due to the absence of known oil and gas deposits.

Conclusion: Production from four projected oil and gas wells would be foregone.

Mineral Development

Surface-disturbing exploration for industrial minerals which have a moderate potential for occurrence in the WSA would be precluded. Due to more accessible deposits elsewhere, no development of the deposits in the WSA is anticipated.

Conclusion: No impacts to mineral development are expected.

Impacts on Vegetation

Juniper and sagebrush communities on 1,000 acres treated by prescribed fire would change to predominately bunchgrass-dominated communities and move toward late seral status in the short term. The ecological status of the rest of the area (approximately 11,000 acres) would remain in mid-seral status. Riparian vegetation would not change. Utilization of forage by livestock would remain at approximately the same level with a corresponding maintenance of residual ground cover.

The 22 miles of ways (covering about 15 acres) once closed to vehicles, would begin to revegetate within two to three growing seasons.

Conclusion: Seral status of 1,000 acres would change to late seral status through prescribed burning. Twenty-two miles of ways, totaling 15 acres, would revegetate.

Impacts on Wildlife

Habitat for approximately 700 mule deer and 200 elk during the winter months and 170 mule deer, 30 elk and 10 antelope during the summer months would be maintained under wilderness designation. Wildlife habitat condition for all wildlife species would be moderately improved through closure of 22 miles of ways. Minor disturbance of wildlife by motorized vehicles would be eliminated. Habitat diversity would be improved through prescribed burning. The populations of big game would not change. ODFW management objectives would be met.

Conclusion: Wildlife habitat (both quality and diversity) would be improved.

Impacts on Watershed

Watershed conditions would be enhanced on 1,000 acres treated by prescribed fire since there would be an increase in ground cover through an increase in bunchgrasses. Erosion would be reduced on steep ways once they are closed to vehicles and revegetation occurs. Plants would hold soil in place and slow surface runoff. There would be no change in watershed conditions over the rest of the area. Water quality would not be affected.

Conclusion: Upland watershed conditions would improve on 1,000 acres through prescribed burning and closure of steep ways.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of approximately 535 AUMs in portions of four grazing allotments. Wilderness designation would preclude the allocation of an additional 76 AUMs since one spring and one reservoir would not be constructed.

Vehicle use for day-to-day livestock management and facility inspection/maintenance would be precluded on 22 miles of ways resulting in some inconvenience and additional expense to livestock operators. Mechanized heavy equipment would be used on the ways once every 10 to 15 years, subject to permit, to maintain three reservoirs. This limited use would allow revegetation of these ways.

Conclusion: Livestock use would continue at current levels of 535 AUMs. A potential allocation of an additional 76 AUMs would be foregone. Vehicle use of 22 miles of ways would be precluded with some inconvenience and an increase in cost to livestock operators.

Impacts on Wood Products Harvest

Wilderness designation would preclude timber harvest on the 2,176 acres of commercial forestland in the WSA. An annual salvage harvest of 11 Mbf on 2,110 acres (550 Mbf in the long term), and an average annual harvest of 60 Mbf (3+MMbf in the long term) on 66 acres, would be foregone.

Conclusion: An average annual harvest level of 71 Mbf (3.55 MMbf in the long term) would be foregone.

Impacts on Recreation Use

Except for 1 mile of dead-end roads, vehicle use would be precluded on 12,110 acres recommended suitable for wilderness. A total of 22 miles of ways would be closed to vehicles. Access to the North Fork of the Crooked River would be more difficult. Anglers and hunters would have to walk up to 2 miles from the western boundary road to get to their favorite fishing and hunting spots. Vehicle-oriented hunting and camping would be displaced to other public land in the general area. There would be a corresponding decrease in visitor use of the WSA by 300 visitor days per year. The quality of hunting and nonmotorized forms of recreation would increase as vehicles were eliminated from the area. There would be an increase in visitor use by people seeking out the wilderness values of the area which would offset the reduction in vehicle-oriented recreation.

Conclusion: A decrease in motorized recreation would be offset by an increase in nonmotorized recreation. The area's recreation use level of 3,000 visitor days per year would continue to increase at a rate of three percent per year.

Impacts on Local Personal Income

Livestock grazing would remain at 535 AUMs, while average annual timber production of 71 Mbf would be precluded. Overall recreation use would remain at 3,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $19,200 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $19,200.

Enhanced Wilderness

Recommended suitable for wilderness: 12,590 acres (assuming acquisition of 480 acres of private land).
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

The enhanced wilderness alternative would add 12,590 acres to the NWPS, assuming acquisition of the 480 acres of private inholdings and mineral estate on 240 acres of split-estate land. Twenty-two miles of ways and one mile of dead-end roads would be closed. All of the WSA would be designated wilderness and wilderness values within the entire area would be protected by legislative mandate.

Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including riparian areas, scenic qualities within the North Fork of the Crooked River canyon, wildlife, cultural values and sensitive plants would also be protected. Acquisition of the private land and mineral estate would prevent potential disturbance from mineral exploration and ensure the preservation of naturalness and opportunities for solitude and primitive and unconfined recreation.

Naturalness

The effects on naturalness would be similar to the all wilderness alternative except that this alternative also includes the acquisition of 240 acres of mineral estate and 480 acres of private land and the closure of 1 mile of dead-end road. Impacts from mineral entry, exploration and other activities affecting naturalness would not occur, and the naturalness of the area would be preserved.

Closing the 22 miles of ways and 1 mile of dead-end roads would allow these roads and ways to revegetate and allow them to become less noticeable, eliminating their unnatural influence on approximately 630 acres.

Prescribed burning of 1,000 acres would be noticeable in the short term. In the long term, naturalness would be improved through restoration of a fire-dependent ecosystem.

Solitude

The effects on solitude would be similar to the all wilderness alternative except for the additional enhancement of opportunities for solitude through road closures and acquisition of private inholdings. Eliminating motorized vehicle use on 22 miles of ways as well as 1 mile of dead-end roads, and precluding mineral entry and exploration on 240 acres of non-Federal mineral estate and 480 acres of private land would further enhance solitude opportunities by increasing the size of the area free from these disturbances. A total of 12.5 miles of the North Fork Canyon would be in public ownership. Solitude would remain limited in the northern part of the WSA due to the proximity of the boundary roads to the study area.

Primitive and Unconfined Recreation

The same increased opportunities for primitive and unconfined recreation as in the all wilderness alternative, resulting from the closure of 22 miles of ways, would occur. In addition, acquisition of the 240 acres of non-Federal mineral estate, acquisition of 480 acres of private inholdings and closure of 1+mile of dead-end roads would significantly enhance opportunities for primitive recreational pursuits. This is especially true since the inholdings are on the river. Access problems along the river corridor would be eliminated. Energy and mineral entry and exploration would be prohibited on these lands which would further preserve a natural setting where primitive recreation opportunities would be available.

Special Features

The impacts to special features would be similar to the impacts identified under the all wilderness alternative but would be enhanced by the acquisition of the 240 acres of non-Federal mineral estate and 480 acres of private land. There would be no need for motorized access to the parcels of acquired private land which would prevent further scarring, soil compaction and erosion to the scenic slopes and plateaus and would reduce damage to cultural sites and disruption to big game and wintering bald eagles.

The elimination of vehicle use on 22 miles of ways and 1 mile of dead-end roads would enhance wilderness values.

Conclusion: Wilderness designation of 12,590 acres would protect and enhance existing wilderness values. The acquisition of 240 acres of mineral estate and 480 acres of private inholdings from willing owners would further enhance the area by preserving existing wilderness values on all lands within the wilderness boundaries.

Impacts on Energy and Mineral Development

Wilderness designation would close 9,038 acres to energy and mineral entry, assuming acquisition of 480 acres of private land and 240 acres of non-Federal mineral estate. Currently, there is a mineral withdrawal on 3,552 acres within the WSA due to a wild and scenic river designation. Considering all these inclusions, the total mineral withdrawn area for the WSA with the enhanced alternative would be 12,590 acres.

Energy Development

Surface-disturbing exploration and development of oil and gas, which has a high potential of occurring in the WSA, would be precluded on 9,038 acres by wilderness designation. Projected development of four production wells would be precluded.

Conclusion: Production from four projected wells would be foregone.

Mineral Development

Surface-disturbing exploration for industrial minerals, which have a moderate potential for occurring in the WSA, would be precluded. Due to more accessible deposits elsewhere, no development of these deposits in the WSA is expected.

Conclusion: No impacts to industrial mineral development are expected.

Impacts on Vegetation

Juniper and sagebrush communities on 1,000 acres treated by prescribed fire would change to predominately bunchgrass-dominated communities and move toward late seral status. The ecological status of the rest of the area (approximately 11,500 acres) would remain in mid-seral status. Riparian vegetation would not change. Utilization of forage by livestock would remain at approximately the same level with a corresponding maintenance of residual ground cover.

The 22 miles of ways and 1 mile of dead-end roads (covering about 18 acres), once closed to vehicles, would begin to revegetate within two to three growing seasons.

Conclusion: Seral status of 1,000 acres would change to late seral status through prescribed burning. Twenty-two miles of ways and 1 mile of roads, totaling 18 acres, would revegetate.

Impacts on Wildlife

Wildlife habitat condition for all species including crucial winter range for deer and elk would be moderately improved through closure of 22 miles of ways and 1 mile of dead-end roads as a result of reduced disturbance and revegetation of disturbed areas. Habitat diversity would be improved through prescribed burning. Big-game populations would not change. ODFW management objectives would be met.

Conclusion: Wildlife habitat quality and diversity would be improved.

Impacts on Watershed

The closure of 22 miles of ways and 1 mile of dead-end roads would slightly improve watershed conditions, primarily where the ways are located on steep slopes and subject to erosion. Closure would allow revegetation to occur which would hold the soil in place and slow surface runoff. Watershed conditions would be enhanced on 1,000 acres treated by prescribed fire since there would be an increase in soil cover through an increase in bunchgrasses. There would be no change in watershed conditions over the rest of the area.

Conclusion: Watershed conditions would improve through prescribed burning on 1,000 acres and the closure of steep eroding ways.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of approximately 535 AUMs in portions of four grazing allotments. Wilderness designation would preclude the allocation of an additional 76 AUMs since one spring and one reservoir would not be constructed.

Vehicle use for day-to-day livestock management and facility inspection/maintenance would be precluded on 22 miles of ways and on 1 mile of dead-end roads, resulting in some inconvenience and additional expense to livestock operators. Mechanized heavy equipment would be used, subject to permit, on the average of once every 10 to 15 years to maintain three reservoirs.

Conclusion: Livestock use would continue at current levels of 535 AUMs. A potential allocation of an additional 76 AUMs would be foregone. Vehicle use of 22 miles of ways and 1 mile of roads would be precluded with some inconvenience and additional expense to the livestock operators.

Impacts on Wood Products Harvest

Wilderness designation would preclude timber harvest on the 2,176 acres of commercial forestland in the WSA. An annual salvage harvest of 11 Mbf (550 Mbf in the long term), and a long-term harvest of 3 MMbf on 66 acres, would be foregone.

Conclusion: The average annual harvest of 71 Mbf (3.55 MMbf in the long term) would be foregone.

Impacts on Recreation Use

Vehicle use would be precluded on all 12,590 acres (assuming successful acquisition of 480 acres of private land) recommended suitable for wilderness. A total of 22 miles of ways and 1 mile of dead-end roads would be closed to motorized recreation. Access to the North Fork of the Crooked River would be more difficult and anglers would have to walk up to 2 miles from the western boundary road to get to their favorite fishing spots. Vehicle-oriented hunting and camping would be displaced to other public land in the general area with a corresponding reduction in visitor use of 300 visitor days per year. The quality of hunting, fishing and other nonmotorized forms of recreation would increase as vehicles were eliminated from the area. Problems resulting from lack of legal access to parts of the canyon would be eliminated through acquisition of the private inholdings. There would be an increase in visitor use by people seeking out the wilderness values of the area which would offset the reduction in vehicle-oriented recreation.

Conclusion: A decrease in motorized recreation resulting from the closure of roads and ways would be offset by an increase in nonmotorized recreation. The area's recreation use level of 3,000 visitor days per year would continue to increase at a rate of three percent per year. Acquisition of 480 acres of private land would increase recreation opportunities.

Impacts on Local Personal Income

Livestock grazing would remain at 535 AUMs, while average annual timber production of 71 Mbf would be precluded. Overall recreation use would remain at 3,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $19,200 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $19,200.

No Wilderness/No Action (Proposed Action)

Recommended suitable for wilderness: 0 acres

Recommended nonsuitable for wilderness: 12,110 acres

Impacts on Wilderness Values

Under the no wilderness alternative, none of the 12,110 acres would be designated wilderness and wilderness values of naturalness, solitude, primitive and unconfined recreation and the area's special features would be subject to the effects of the projected management actions. These actions include energy exploration and development, continued vehicle use limited to existing roads and ways, livestock developments and prescribed burning of 4,000 acres of juniper and sagebrush.

Naturalness

Vehicle use on 22 miles of ways and 1 mile of dead-end roads would continue the impact of vehicles upon naturalness on approximately 630 acres (five percent of the WSA). Most of this influence upon the area's naturalness would occur on the eastern and western plateaus of the area. Naturalness in the northern part of the WSA, already limited due to the proximity of boundary roads to the study area, would also continue to be affected by vehicle use on existing ways.

Surface-disturbing energy exploration and development would cause short and long-term impacts to naturalness. Projected oil and gas development would directly affect naturalness on 15 acres and visually influence naturalness on 500 acres, depending on the vegetative screening available. Surface testing for industrial minerals would directly affect naturalness on two acres and visually influence 40 acres. Prescribed burning of juniper and sagebrush would affect naturalness on 4,000 acres in the short term. In the long term, naturalness would be increased through the restoration of a fire-dependent ecosystem.

Livestock projects including a reservoir, spring development and trail would directly influence four acres and visually influence 400 acres (three percent of the WSA). The trail would significantly affect naturalness in the otherwise natural-appearing river canyon. These projects would allow for the allocation of an additional 76 AUMs to livestock, resulting in a slight increase in forage utilization and a more grazed appearance of the vegetation, especially near the reservoir and spring.

The naturalness of the northern part of the WSA would be further reduced by timber harvest on 66 acres. Naturalness is already limited due to past logging activity. Naturalness on 1,257 acres in the rest of the WSA would be slightly reduced through harvest of dead and dying trees, although few acres would be affected in any given year. In the long term, naturalness would be directly affected on 100 acres and visually influenced on 1,000 acres through projected timber harvest in the WSA.

Solitude

Continued vehicle use on 22 miles of ways and 1 mile of dead-end roads, and human activity associated with energy and mineral exploration and development, motorized recreation use, logging activities and livestock developments would cause repeated impairment of solitude opportunities adjacent to the activity. Prescribed burning would reduce solitude where large areas of juniper are burned, reducing vegetative screening.

Primitive and Unconfined Recreation

Vehicle use would continue to be limited to the existing 1 mile of dead-end roads and 22 miles of ways within the WSA and would continue to intrude on primitive, nonmotorized recreation opportunities in adjacent areas.

Construction of the 1.5 mile of livestock trail and 2.5 miles of oil and gas access road would allow additional motorized vehicle access into the WSA, reducing opportunities for wildlife observation, photography, and sightseeing. Construction of one reservoir and spring development would improve opportunities for primitive and unconfined recreation associated with water resources such as hunting, bird watching and camping.

Logging activities, especially in the northern part of the WSA, would reduce opportunities for primitive recreation through surface disturbance and construction of temporary access roads. These effects would be expected to be short term.

Additional livestock use would increase vegetation removal, trampling, fecal deposits and water fouling where livestock concentration occurs, such as at water sources and on level ground. These are places recreationists also prefer to use.

Special Features

Continued vehicle use of existing roads and ways would maintain the impacts on special features including seasonal disturbance of big game and wintering bald eagles and continued soil compaction and erosion affecting the scenic quality of the WSA. Energy development, logging activities and livestock developments would result in long-term disturbance of scenery and habitat for mule deer and elk. There would be no impact on wintering bald eagles or sensitive plants.

Conclusion: In the absence of wilderness designation, projected activities would both directly and indirectly impair wilderness values on a long-term basis on approximately 2,600 acres (21 percent of the WSA) with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire WSA would be open to energy and mineral entry.

Energy Development

Oil and gas exploration and development would be allowed in the entire WSA. Based on favorable indications, development of four oil and gas wells is projected.

Conclusion: Production from four projected oil and gas wells would occur.

Mineral Development

Mineral entry would be allowed within the WSA. Since industrial minerals with better accessibility are located elsewhere in the general area, development of the projected deposits in the WSA is not expected.

Conclusion: No impact to industrial mineral development is expected.

Impacts on Vegetation

For 4,000 acres treated by prescribed burning, the sagebrush and juniper communities in mid-seral status would change to late seral status in the short term. Vegetation would be disturbed on 15 acres from energy development, on two acres from mineral exploration activities and on four acres from livestock developments.

The seral status of 66 acres of ponderosa pine forest would change toward early seral status in the long term as a result of overstory removal timber harvest. Vegetative productivity of this area would decrease as woody material is removed and not allowed to decompose on the forest floor. The seral status of the remaining 1,257 acres of commercial forest land would be maintained through the harvest of dead and dying trees. A total of 100 acres of vegetation would be significantly disturbed in the long term through timber harvest in the WSA.

Conclusion: Juniper and sagebrush on 4,000 acres in mid-seral status would change to late seral status. Seral status of 66 acres of forest land would change toward early seral, and long-term vegetative productivity would diminish. Vegetation would be disturbed on an additional 55 acres through salvage timber sales, livestock developments and energy and mineral activities.

Impacts on Wildlife

Wildlife habitat for approximately 700 wintering mule deer and 200 wintering elk, as well as the summer big-game populations and the wintering northern bald eagles, would be maintained. ODFW management goals would be met. Prescribed burning would be accelerated to increase habitat diversity with 4,000 acres (approximately 34 percent of the WSA) burned in a 50-year period. The potential for disturbance on a total of 17 acres from energy and mineral exploration and development would continue.

Conclusion: Enhancement of wildlife habitat through prescribed burning would outweigh disturbance from projected mineral activities and as a result, wildlife habitat would slightly improve overall. Populations would not change.

Impacts on Watershed

Watershed conditions would be enhanced on 4,000 acres treated by prescribed fire since there would be an increase in ground cover through an increase in bunchgrasses.

Soil disturbance from logging activity on 66 acres and 4.5 miles (five acres) of road and trail construction associated with energy and livestock developments would increase sedimentation and decrease water quality of the North Fork of the Crooked River. Given the total watershed of the river these impacts would be minimal.

The remainder of the watershed would not change.

Conclusion: Upland watershed conditions would improve on 4,000 acres through prescribed burning. A decrease in condition would occur in 71 acres from logging, energy and livestock activities which would cause slight deterioration of water quality.

Impacts on Livestock Grazing

With the development of one reservoir and one spring, an additional 76 AUMs of forage would be allocated. Total livestock forage allocation would be 611 AUMs. Vehicle use for livestock management and facility inspection/maintenance would continue on 22 miles of ways and 1 mile of dead-end roads. Construction of a 1.5-mile trail for livestock access to the North Fork canyon would improve the distribution of livestock grazing in this area.

Conclusion: An additional allocation of 76 AUMs would be realized.

Impacts on Wood Products Harvest

All 2,176 acres of commercial forestland would be available for salvage timber harvest. Overstory removal on 66 acres of National Forest land and salvage harvest on 2,110 acres would produce an average annual harvest volume of 71 Mbf.

Conclusion: An average annual volume of 71 Mbf would be harvested.

Impacts on Recreation Use

Vehicle access for hunting and fishing would continue on 22 miles of ways and 1 mile of dead-end roads. Additional access would be provided through energy development access roads. Surface disturbance and disruption of wildlife from projected management activities would slightly disturb the natural setting and scenic values by placing unnatural features on the landscape. All other activities such as photography, bird watching, hiking, camping and sightseeing would continue. Recreation use would continue to increase at a rate of approximately three percent per year.

Conclusion: The area's recreation use level of 3,000 visitor days per year would continue to increase at an annual rate of three percent per year.

Impacts on Local Personal Income

Livestock grazing would increase by 76 AUMs, while average annual timber production would remain at 71 Mbf. Projected energy and mineral development would amount to four oil and gas production wells. Overall recreation use would remain at 3,000 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $900 per year with an unknown level of increase attributable to projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $900.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (no wilderness/no action) wilderness values would be adversely affected by mineral and livestock developments as well as timber harvest activities which would lead to 121 acres of surface disturbance which would visually influence approximately 2,600 acres.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, existing uses would continue and additional uses would occur. Future development options including harvest of wood products, oil and gas exploration and development, and rangeland developments would remain open. Long-term productivity of wilderness values would be adversely impacted on approximately 2,600 acres with surface disturbance and visual influence from oil and gas development, rangeland developments and the harvest of wood products, with further declines from other uses over the long term.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action, oil and gas reserves produced from four oil and gas wells would be irretrievably committed on 15 acres. Wilderness values would be reduced on approximately 2,600 acres due to surface disturbance and visual influences from projected energy, timber and rangeland developments.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The North Fork WSA would be manageable as wilderness under both the all wilderness and enhanced wilderness alternatives; however, there are factors which cause wilderness manageability problems.

In the all wilderness alternative the location of the two separate private inholdings within the Crooked River Canyon would legally restrict movement through the WSA. The private land is used for livestock grazing and does not presently affect the manageability of the WSA. There has been no indication that use of the private land would change.

Although none is projected, potential mineral development of split-estate lands could reduce naturalness and opportunities for solitude. The two dead-end roads within the WSA detract from the naturalness of the area and vehicle traffic on the roads reduces solitude.

The private inholdings, split-estate land and dead-end roads would not be a problem in the enhanced wilderness alternative, assuming acquisition of the inholdings and split estate was successful. However, the large number of vehicle ways originating from the boundary roads and the many ridges along the boundary roads present a substantial problem in enforcing a vehicle closure in the WSA. This would cause manageability problems in both the all wilderness and enhanced wilderness alternatives.

Rationale for Selection of the Proposed Action

The no wilderness/no action alternative is the proposed action because the benefits of maintaining options for oil and gas exploration and development, timber harvest and livestock grazing increases and leaving vehicle routes open to vehicle use by hunters, anglers and livestock operators outweigh the benefits of preserving the area's wilderness values.

The area's wilderness values are reduced by the evidence of past logging activities inside the WSA and by logging and ranching activities outside the area which can be seen and heard from within the area.

6. Summary and Analysis of Public Comments

The following is a summary of public comments and responses to those comments specific to this WSA. They deal with the adequacy of the analysis in this appendix. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analyses are addressed in the Statewide volume.

Comment: The analysis in the supplement to the Wilderness DEIS concerning diversity of plants in the transition zone between the high desert and the Ochoco National Forest was not properly addressed. **Response:** The information is now included in the Vegetation section under the Affected Environment.

Comment: The supplement to the Wilderness DEIS fails to address the impact of salvage harvest adequately. **Response:** The information is now included in the Environmental Consequences section of this appendix. Present management emphasizes wildlife, watershed and scenic values over salvage harvest.

Comment: The two waterfalls are not mentioned in the wilderness data. **Response:** One waterfall is on private land. The waterfall on public land is now addressed as special features in the Affected Environment section of this appendix.

Comment: Special features including geological, botanical, raptor habitat, crucial elk range and cultural resources were not adequately addressed. **Response:** The special features have now been addressed further in the Affected Environment section under Wilderness Values.

Comment: The Wilderness DEIS does not adequately address the bald eagle roosting in the WSA. **Response:** This information is now included in the Affected Environment section under Special Features and impacts to wintering bald eagles are discussed under Impacts on Wilderness Values, Special Features in the Environmental Consequences section.

Comment: The Wilderness DEIS ignores five plant associations from the Blue Mountain transition. **Response:** This information is now addressed in the Affected Environment section under Diversity in the National Wilderness Preservation System and Vegetation discussions.

Comment: The status of the North Fork of the Crooked River as a wild and scenic river is unclear. **Response:** A 32.3-mile segment of the North Fork of the Crooked River was designated as a component of the National Wild and Scenic River System in October 1988. This designation is discussed further in the Interrelationships section.

Comment: There are 12 miles of the North Fork of the Crooked River in this WSA on public land and 1.75 miles on private. **Response:** The draft appendix incorrectly stated that there are 7 miles of the North Fork of the Crooked River in the WSA. This has been changed to read that there are 12.5 miles of river within the WSA.

Table 1. Summary of Proposed Management Under Each Alternative, North Fork WSA (OR-5-31)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Proposed Action)
Acres Designated as Wilderness	12,110	12,110	0
Acres Closed to ORVs by Wilderness Designation[1]	12,110	12,110	0
Miles of Road Closed	0	1	0
Miles of Ways Closed	22	22	0
Acres of Full Fee Estate acquired[2]	0	480	0
Acres of Mineral Estate acquired [3]	0	240	0
Energy/Mineral Actions			
Acres Withdrawn from Energy and Mineral Location and Leasing by Wilderness Designation [4]	8,318	8,318	0
Roads Constructed (miles)	0	0	2.5
Oil and Gas Pipelines (miles)	0	0	3
Drill Sites (number)	0	0	4
Non-structural Wildlife Projects Developed:			
Brush Control without Seeding (acres)	1,000	1,000	4,000
Structural Livestock Projects Developed:			
Reservoirs (number)	0	0	1
Springs (number)	0	0	1
Trail (miles)	0	0	1.5
Additional Forage Allocated from Projects (AUMs)	0	0	76
Acres of Timber Available for Harvest	0	0	2,176
Average Annual Harvest Volume (Mbf)	0	0	71

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[1] Except for 22 miles of ways and 1 mile of dead-end road in the WSA, most of the acreage shown is already closed to cross-country vehicle use through an existing "limited" ORV designation.

[2] Upon acquisition from willing landowners, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] Upon acquisition of the mineral estate, these lands would be withdrawn from energy/mineral location and leasing.

[4] A total of 3,552 acres in the WSA are already withdrawn from mineral location and leasing through Congressional designation of the area as a wild and scenic river and 11.1 miles of the river being classified as "wild".

Table 2. Summary of Environmental Consequences of Alternatives, North Fork WSA (OR-5-31)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Proposed Action)
Wilderness Values	Wilderness designation of 12,110 acres would protect and enhance existing wilderness values.	Wilderness designation of 12,590 acres, including acquisition of 480 acres of private land and 240 acres of mineral estate, would protect and enhance existing wilderness values.	Projected management actions would impair wilderness values on approximately 2,600 acres, with further declines from other potential uses over the long term.
Energy and Mineral Development	Projected production from four oil and gas wells would be foregone.	Projected production from four oil and gas wells be foregone.	Projected production from four oil and gas wells would occur.
Vegetation	Seral status of 1,000 acres would change to late seral and 15 acres (22 miles of ways would revegetate.	Seral status of 1,000 acres would change to late seral and 18 acres (23 miles of ways and roads) would revegetate.	Seral status of 4,000 acres would change to late seral and 66 acres changed toward early seral. Vegetation disturbed on 55 acres through projected management actions.
Wildlife	Wildlife habitat quality and diversity would be improved.	Wildlife habitat quality and diversity would be improved.	Wildlife habitat would be maintained.
Watershed	Upland watershed conditions improved on 1,000 acres.	Upland watershed conditions improved on 1,000 acres.	Upland watershed conditions improved on 4,000 acres. Short-term decrease in condition on 71 acres.
Livestock Grazing	Livestock use would continue at current levels of 535 AUMs. Potential allocation of 76 AUMs foregone. Some inconvenience and expense to livestock operators through closure of 22 miles of ways.	Livestock use would remain at current levels of 535 AUMs. Potential allocation of 76 AUMs foregone. Some inconvenience and expense to livestock operators through closure of 22 miles of ways and 1 mile of dead-end roads.	Livestock use would increase to 611 AUMs with an additional 76 AUMs allocated.
Wood Products Harvest	Average annual harvest of 71 thousand board feet of timber foregone.	Average annual harvest of 71 thousand board feet of timber foregone.	Average annual harvest of 71 thousand board feet of timber available.
Recreation Use	No impact in total use, but there would be a change from motorized to nonmotorized recreation.	No impact in total use, but there would be a change from motorized to nonmotorized recreation.	No impact.
Local Personal Income	Annual local personal income would decrease by approximately $19,200.	Annual local personal income would decrease by approximately $19,200.	Annual local personal income would increase by approximately $900.

Table 3. Classification of Energy and Mineral Potential, North Fork WSA (OR-5-31)

Commodity	Area	Level of Potential	Level of Certainty
Metals	Entire WSA	L	B
Diatomite	Entire WSA	L	C
Limestone	Entire WSA	L	C
Zeolites	See Map 4	M	B
	Rest of WSA	L	C
Bentonite	See Map 4	M	C
	Rest of WSA	L	C
Uranium/Thorium	Entire WSA	O	B
Geothermal	Entire WSA	O	C
Oil/Gas	Entire WSA	H	C
Sodium/Potassium	Entire WSA	L	B
Coal	Entire WSA	O	B
Tar Sands/Oil Shale	Entire WSA	O	B
Sand and Gravel	Entire WSA	L	C
Crushable Rock	Entire WSA	L	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

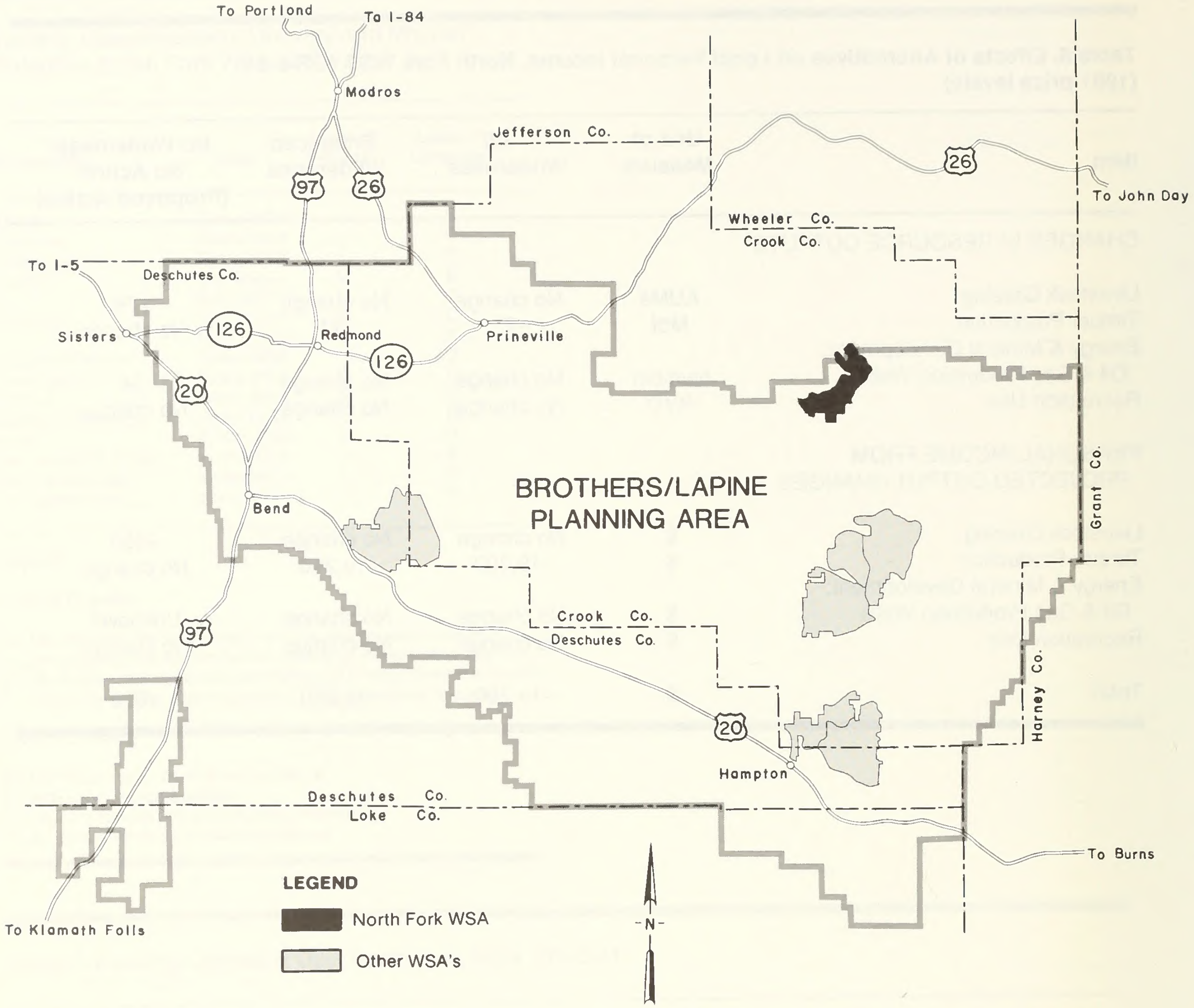
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

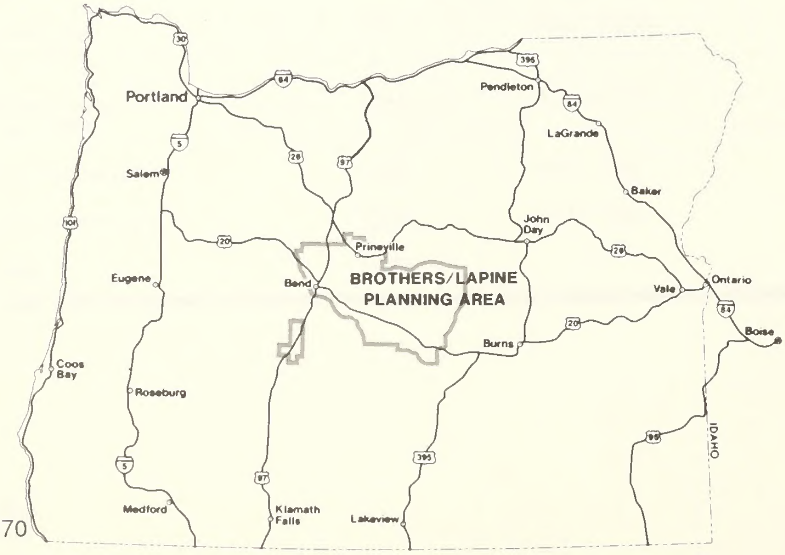
Table 4. Existing Livestock Use, North Fork WSA (OR-5-31)

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allotment in WSA	Current Estimated Use in WSA (AUMs)
North Fork (No. 0053)	811	4/16 - 10/30	32	270
Rabbit Valley (No. 0050)	548	4/16 - 11/15	36	179
Fox Canyon C & H	1,060	6/10 - 9/30	3	33
Big Summit C & H	1,848	6/16 - 9/30	3	53
Totals	4,267			535

Table 5. Effects of Alternatives on Local Personal Income, North Fork WSA (OR-5-31) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action (Proposed Action)
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	No change	+76
Timber Production	Mbf	-71	-71	No change
Energy & Mineral Development:				
Oil & Gas Production Wells	Number	No change	No change	+4
Recreation Use	RVD	No change	No change	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	No change	No change	+900
Timber Production	$	-19,200	-19,200	No change
Energy & Mineral Development:				
Oil & Gas Production Wells	$	No change	No change	Unknown
Recreation Use	$	No change	No change	No change
Total	$	-19,200	-19,200	+900





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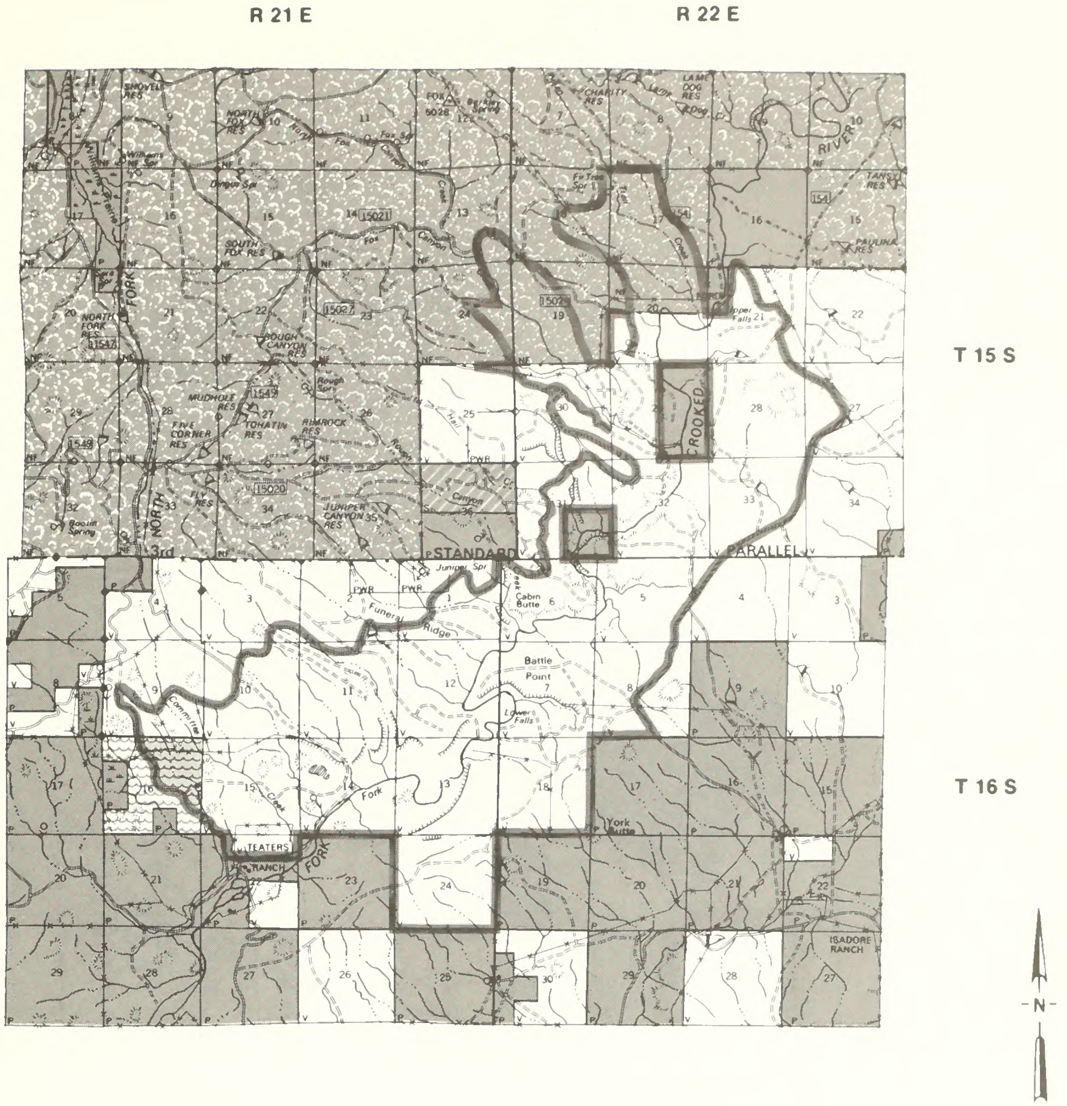
North Fork WSA
OR-5-31

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

░ BLM Land Studied Under Section 202 of FLPMA (Other BLM Land in WSA Studied Under Section 603 of FLPMA)

━ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

■ Private

▩ U.S. Forest Service

≋ BLM Surface-State or Private Subsurface (Split Estate)

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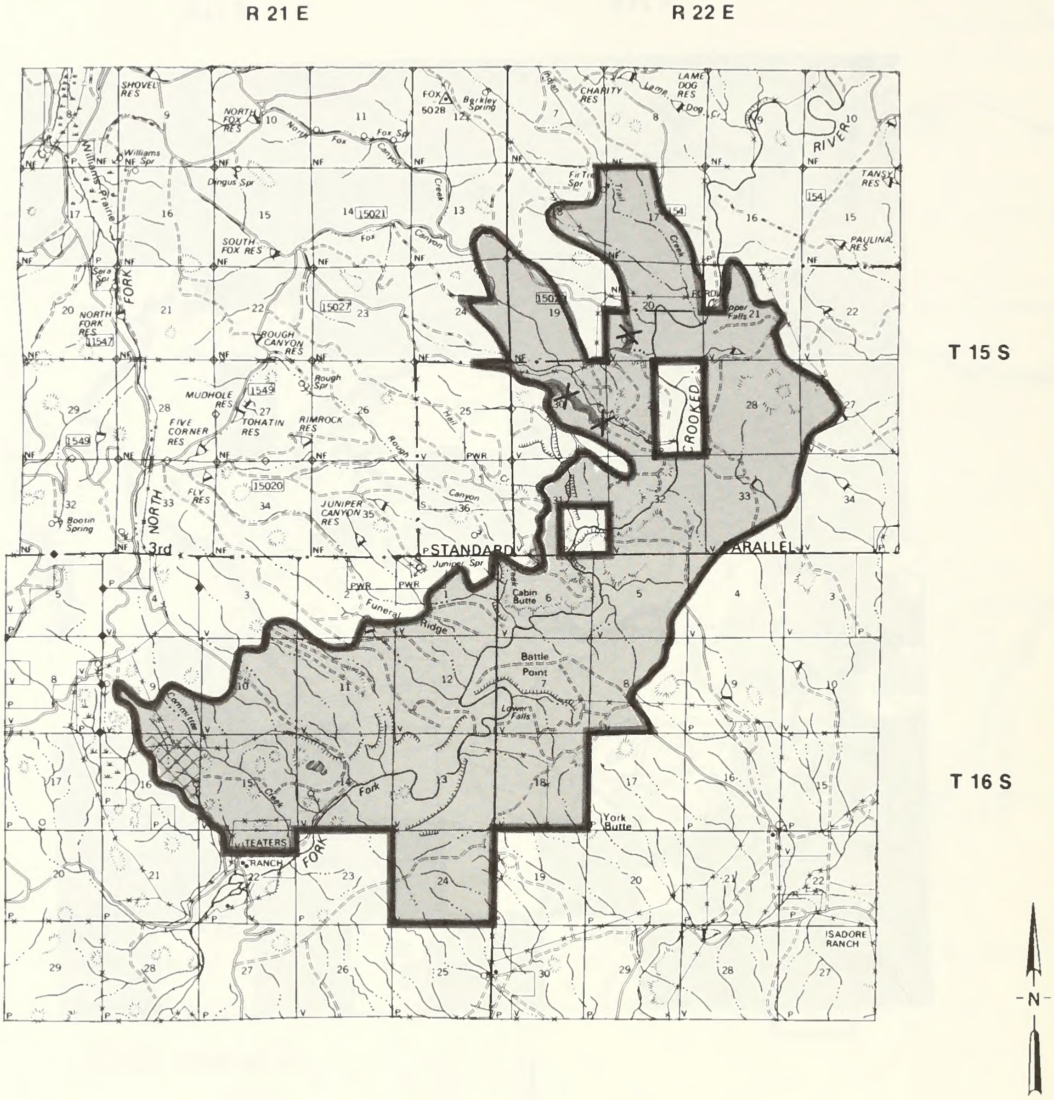
North Fork WSA
OR-5-31

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

▨ Recommended Suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

✕—✕ Recommended Road Closure

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North Fork WSA
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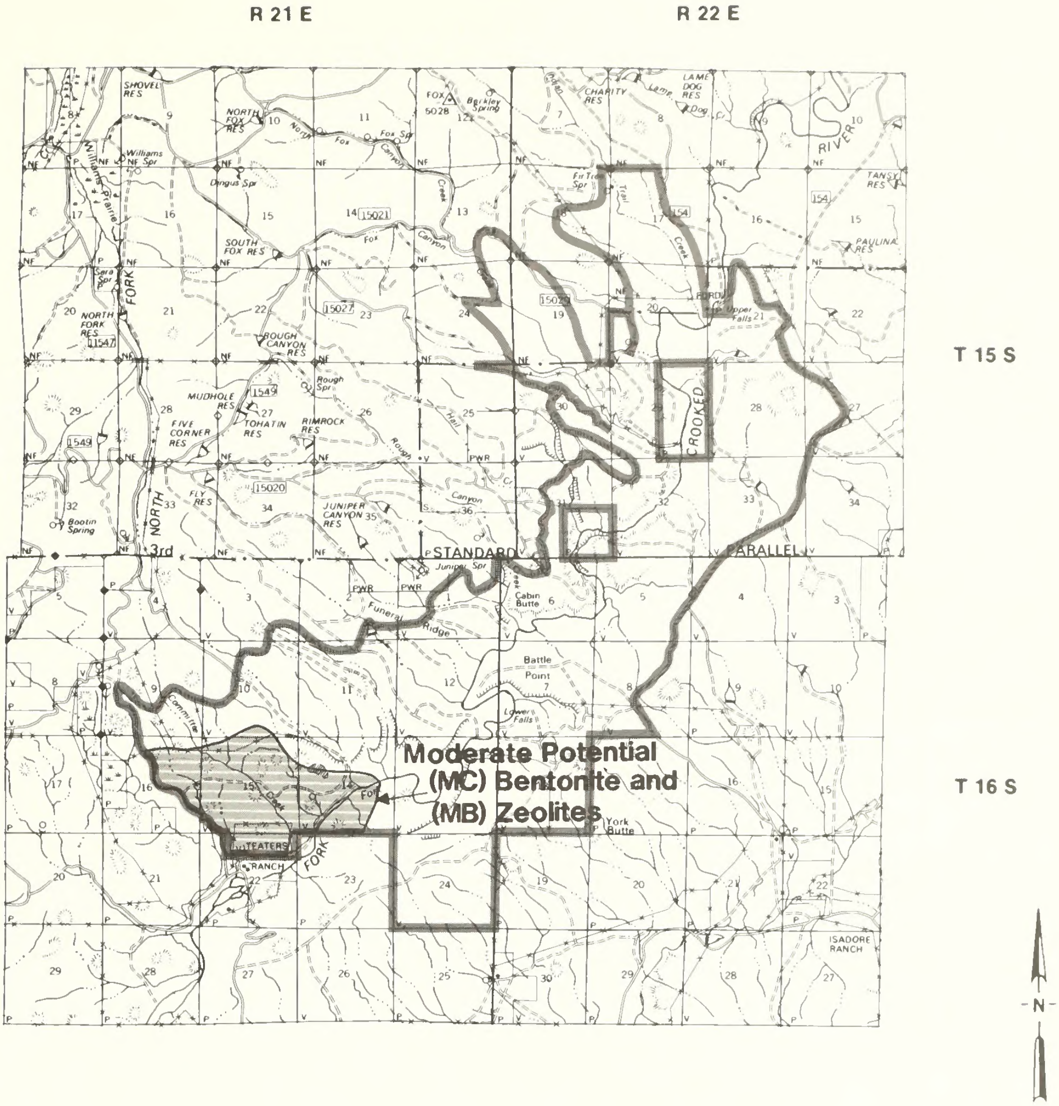
ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



Entire WSA:
High Potential
(HC) for Oil and Gas

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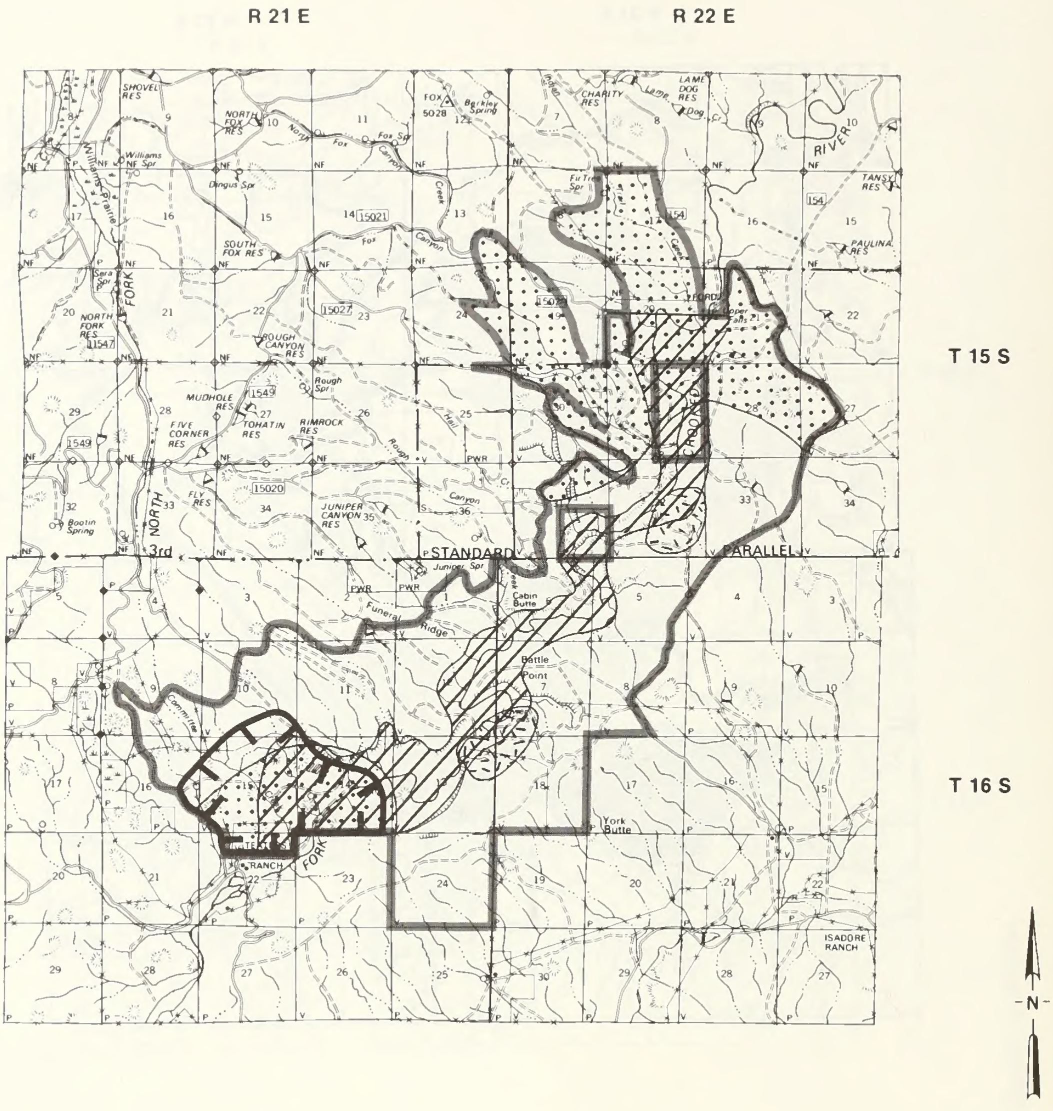
OR-5-31

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

MAP 4



⸬ Botanical Values

▨ Outstanding Scenic Values

⸬ Crucial Mule Deer and Elk Winter Range

┳━┳ Geological/Paleontological Values – Fossil Bearing Geologic Formation

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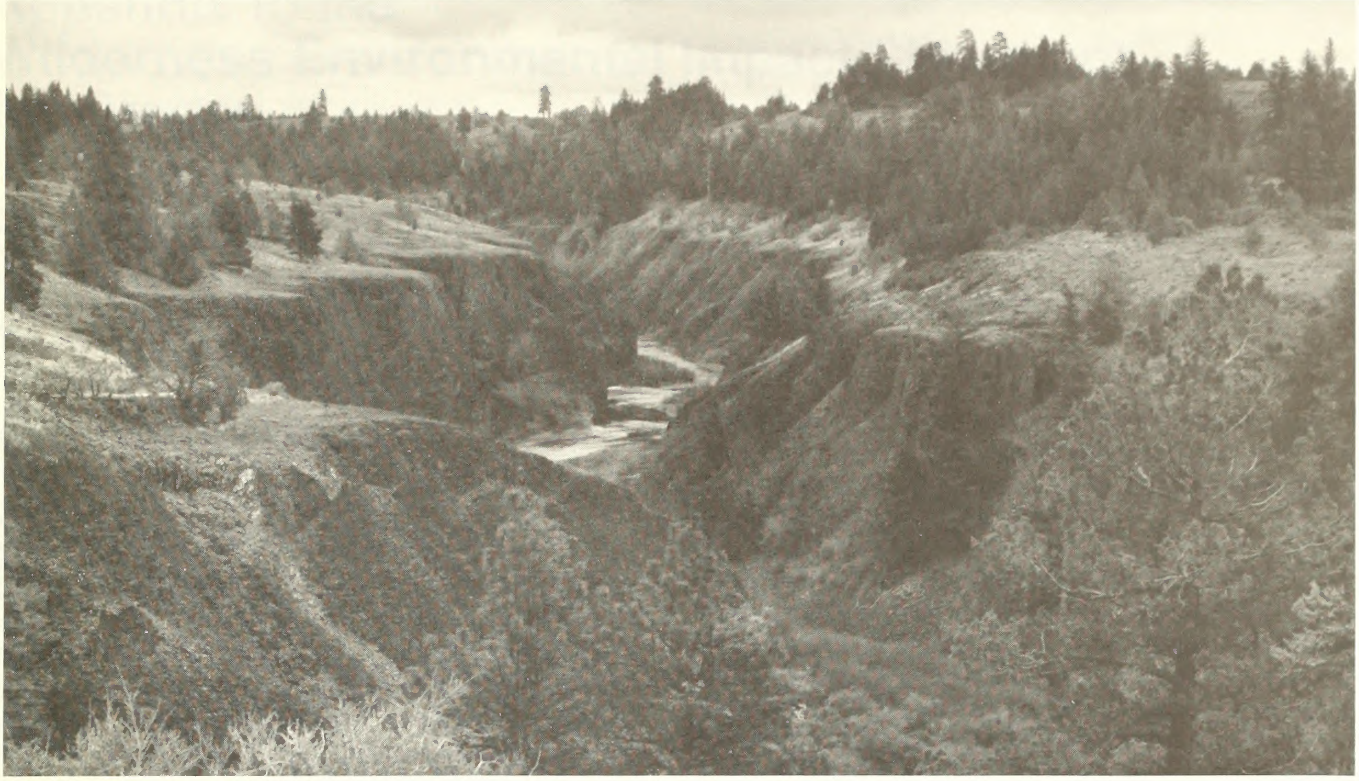
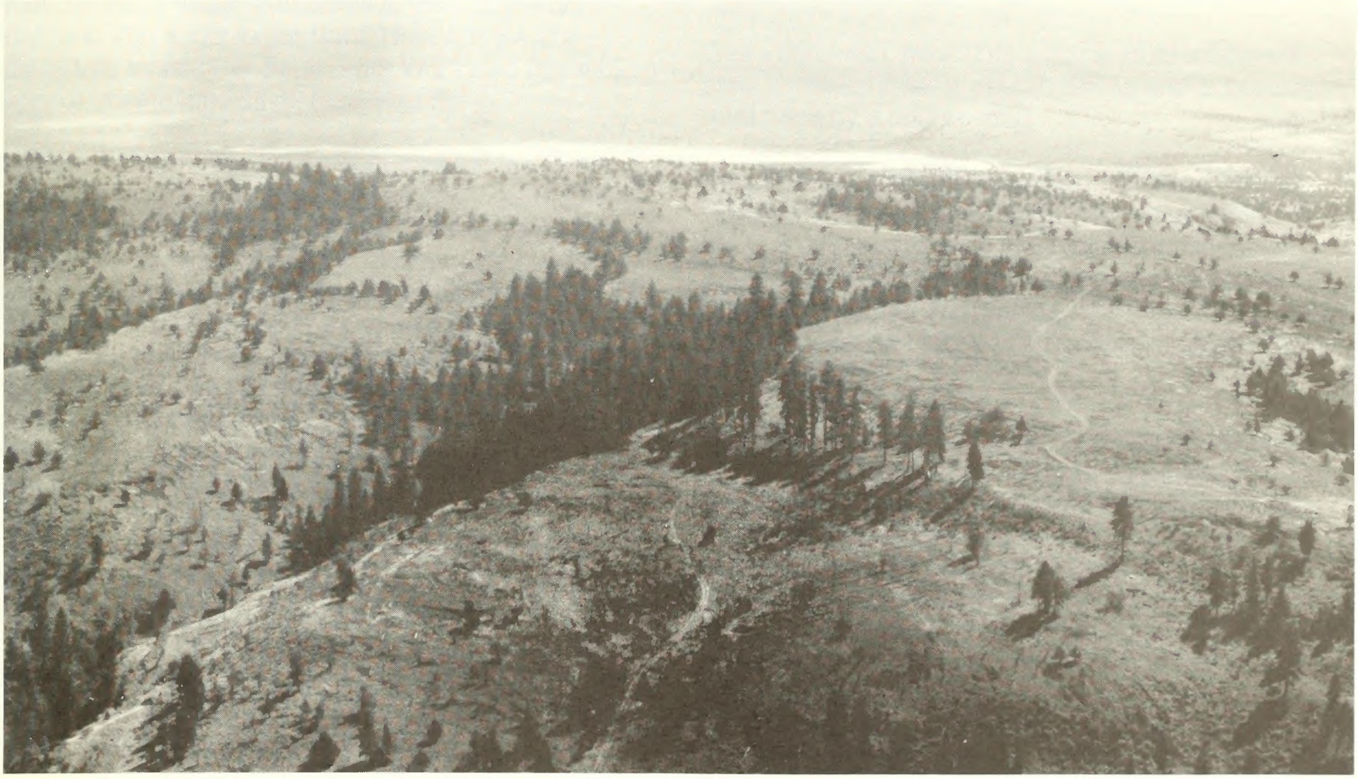
SPECIAL FEATURES

1 0 1 2 MILES

MAP 5



North Fork WSA, OR-5-31. Looking northeast into the north-central portion of the WSA in the North Fork of the Crooked River Canyon. Within area recommended suitable under the enhanced and nonsuitable under the proposed action (no wilderness/no action alternative). September 1979.



North Fork WSA, OR-5-31. Areal view looking east in the east-central portion of the WSA (background is outside of the WSA). Within area recommended suitable under the enhanced alternative and unsuitable under the proposed action (no wilderness/no action alternative). Shows vehicle ways within the WSA. September 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

South Fork (OR-5-33) and Sand Hollow (OR-5-34) Wilderness Study Areas

1. Introduction

General Description of Study Area

The South Fork and Sand Hollow Wilderness Study Areas (WSAs) are in Crook County, approximately 60 miles east of Bend, Oregon, and 170 miles southeast of Portland (see Map 1). U.S. Highway 20 passes 20 miles to the south of the WSAs.

There are 19,631 acres of public land within the South Fork WSA and 8,791 acres within the Sand Hollow WSA. Of these totals, 240 acres in the South Fork WSA and 700 acres in the Sand Hollow WSA are split-estate lands. The South Fork WSA also has 440 acres of private inholdings (see Map 2).

The South Fork WSA lies on both sides of the South Fork of the Crooked River and is roughly rectangular in shape, averaging about 7 miles north to south and 5 miles east to west. The Sand Hollow WSA, immediately to the west and separated from the South Fork WSA by a BLM-maintained road, is generally round in shape, with the southern portion narrowing to a point. Private property and BLM and county-maintained roads form the boundaries of these WSAs. Two dead-end roads, one in each WSA and totaling 2.1 miles, form part of the boundary.

The main features of the South Fork WSA are: the 700 to 800-foot deep basalt rimrock canyon of the South Fork of the Crooked River; Pickett Canyon, a side canyon on the South Fork; and the open grassland of the Twelvemile Table mesa and Sulphur Butte areas, which are rolling and somewhat broken juniper and sagebrush-covered landscapes.

In the Sand Hollow WSA, rolling hills extending in an east-west direction form part of Steens Ridge. There is a relatively open desert plateau in the central part of the Sand Hollow WSA. In the northern portion, Columbia River basalt escarpments are interspersed with rolling desert topography. Vegetation is a big sagebrush/bunchgrass community. Juniper trees are scattered throughout the WSA.

The South Fork of the Crooked River is the only noteworthy water source in the South Fork WSA. A tributary of the Crooked River, it has average annual flows ranging from 15 cubic feet per second in late summer to 125 cubic feet per second during periods of spring runoff. Overall water quality meets state water quality standards. There are no perennial water sources within the Sand Hollow WSA.

Interrelationships

Gerry Mountain WSA (OR-5-35) is located immediately to the southwest of both WSAs and is separated from them by a county road.

The northern portions of the South Fork and Sand Hollow WSAs fall within lands which were ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. The treaty reserved rights to the Indians for hunting, fishing, and gathering in usual and accustomed places and grazing stock on unclaimed lands.

Both WSAs are located within the Oregon Department of Fish and Wildlife (ODFW) Maury Wildlife Unit. The Sand Hollow WSA supports approximately 80 mule deer in spring, 20 in summer and 80 in winter. Approximate antelope populations in the Sand Hollow WSA for spring, summer, fall and winter are four, four and six respectively. In the South Fork WSA the approximate mule deer levels in spring, summer, fall and winter are 250, 125 and 300 respectively. Approximate antelope populations in spring, summer, fall and winter for the South Fork WSA are 15, 15 and 60 respectively. Approximately 15 elk occupy the WSA complex on a yearlong basis. ODFW management goals for elk, antelope and mule deer are to maintain these populations at existing levels. The goal for nongame wildlife is to maintain populations of naturally occurring species at self-sustaining levels. Sage grouse occur in the South Fork WSA east of the South Fork of the Crooked River. The ODFW Management goal for sage grouse is to restore populations of this Federal candidate species to a level where listing would not be needed. The proposed action for these WSAs conforms with ODFW's management goals for game and nongame wildlife species.

Crook County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study, and EIS planning, scoping and public review processes. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSAs, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- impact on the area's wilderness values, including outstanding opportunities for solitude and primitive recreation, and special features including scenery and a small herd of wild horses;
- impact on livestock grazing use levels and management;
- impact on energy and mineral development;
- impact on antelope, mule deer, elk and nongame wildlife populations, and
- impact on recreation use levels.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made. All road boundaries would have the standard setbacks.

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness (proposed action)
- no wilderness/no action

An opportunity exists to close the BLM-maintained road between the South Fork and Sand Hollow WSAs and manage them as a single unit if they were both designated as wilderness. This is analyzed in the enhanced wilderness alternative.

Public comments raised an alternative which would combine the South Fork and Sand Hollow WSAs and recommend all lands suitable. This alternative is not analyzed because the environmental consequences of implementing that alternative would not differ significantly from impacts analyzed in either the all wilderness or enhanced wilderness alternatives.

Another alternative which would combine these two WSAs with the Gerry Mountain WSA by closing the county road is also not analyzed; the road is an important local traffic route and closing it would not be feasible.

All Wilderness

Under this alternative, all 19,631 acres of public land in the South Fork WSA and 8,791 acres of public land in the Sand Hollow WSA would be recommended suitable as wilderness (see Map 2). The west and north boundary of the South Fork WSA would be a bladed road and private land, and the east and south boundary a low standard dirt road and private land. A portion of the west boundary would consist of a high standard gravel road. The north and east boundary of the Sand Hollow WSA would be a bladed road while the south and west boundary would be a high standard gravel road (a portion of which is oiled) and private land. For purposes of analysis this alternative assumes the private inholdings and the mineral estate of the split-estate lands would not be acquired and the dead-end roads within the WSAs would remain open. The 13.4 miles of ways within the WSAs would be closed.

Energy and Mineral Development Actions

Wilderness designation would close 19,391 acres within the South Fork WSA and 8,091 acres within the Sand Hollow WSA to mineral entry. Split-estate land totaling 240 acres in the South Fork WSA and 700 acres in the Sand Hollow WSA would be open to mineral exploration and development. Development of 20 existing claims (8 pre-FLPMA and 12 post-FLPMA) for semi-precious stones would continue at the present low level. In the long term, 20 acres would be disturbed by this activity. In addition, 440 acres of private inholdings in the South Fork WSA would remain open to mineral exploration and development at the landowner's discretion. Surface-disturbing exploration and development of oil and gas, semi-precious stones, bentonites and zeolites would be prohibited on 27,482 acres.

The 940 acres of split-estate lands within the WSAs have high potential for oil and gas, and exploration would be expected. However, in the absence of known oil and gas deposits, development is not anticipated on these small isolated parcels.

In the western portion of the Sand Hollow WSA, approximately 60 acres of split estate have high potential for bentonite and medium potential for zeolite deposits. Exploration would likely involve surface examination and sampling. Due to large deposits of bentonite and smaller deposits of zeolites elsewhere in the valley and lack of good access, it is unlikely that these deposits would be economic and therefore no development is projected.

Wildlife Habitat Management Actions

For both the South Fork and Sand Hollow WSAs, habitat would be managed to support maximum species diversity and populations in accordance with ODFW management goals and consistent with guidelines established in the BLM's Wilderness Management Policy. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing management plan and fire management. Proposed projects in the Sand Hollow WSA include 3,500 acres of prescribed burning and 80 acres of juniper clearing by burning, if possible, but by hand thinning if necessary. In the South Fork WSA prescribed burning of 8,000 acres is proposed. The prescribed burning is necessary to maintain the existing fire-dependent ecosystem and would be allowed under wilderness designation. Any acreage burned by wildfire would replace on an acre-by-acre basis the acreage proposed for prescribed burning. The 80-acre juniper clearing is necessary to maintain an aspen stand and would also be allowed under wilderness since it would correct an unnatural condition resulting from human influence which could not be corrected by management alone. While 11,500 acres are proposed for prescribed burning, it is projected that only 1,000 acres would actually burn due to the existing lack of fire-carrying understory and management restrictions on burning during extreme fire condition periods.

Livestock Management Actions

Livestock use in the South Fork WSA would remain at the current level of approximately 1,236 AUMs, and at 412 AUMs in the Sand Hollow WSA. The season of use would remain as identified in Table 4. Livestock use in the South Fork Canyon would continue to be early spring, incorporating rest to improve riparian vegetation. Vehicle use for day-to-day livestock management would be precluded on 9.4 miles of ways in the South Fork WSA and 4 miles of ways in the Sand Hollow WSA. Management of livestock and maintenance of 14.4 miles of fence in the South Fork WSA and 8 miles in the Sand Hollow WSA would be conducted primarily from horseback. Mechanized heavy equipment would be used, subject to permit, on the average of once every 10 to 15 years to maintain 13 reservoirs in the South Fork WSA and seven reservoirs in the Sand Hollow WSA.

Watershed Management Actions

None of the proposed projects would be allowed under this alternative.

Recreation Management Actions

The entire 19,631 acres in the South Fork WSA and 8,791 acres in the Sand Hollow WSA would be closed to vehicle use except for 1.5 miles of dead-end road in the South Fork WSA and 0.6 miles of dead-end road in the Sand Hollow WSA. The 6.4 miles of road between the WSAs would also be left open. The 9.4 miles of ways in the South Fork WSA and 4 miles of ways in the Sand Hollow WSA would be closed. At present, vehicle use is limited to these roads and ways within the WSA. Current recreation use is estimated to be 4,500 visitor days per year. Most of this current use utilizes vehicles for access to rock-hounding, fishing and hunting areas.

Enhanced Wilderness (Proposed Action)

Under this alternative, 17,001 acres in the South Fork WSA and 8,391 acres in the Sand Hollow WSA would be combined and recommended suitable for wilderness. The private inholdings in the South Fork WSA, totaling 400 acres, and the mineral estate of the 240 acres and 640 acres of split-estate land in the South Fork and Sand Hollow WSAs, respectively, would be acquired through purchase or exchange with willing landowners. Assuming acquisition of these parcels, the total area recommended suitable under this alternative would be 25,792 acres. The bladed road between the two WSAs (6.4 miles), the dead-end reservoir access road in the Sand Hollow WSA (0.6 mile), 6.5 miles of ways in the South Fork WSA and 4 miles of ways in the Sand Hollow WSA would be closed (see Map 3). The boundary of the WSA would consist of a high standard gravel road on the southwest; rimrock, private land, and a bladed road on the north and northwest; and a low standard dirt road and private land on the south and east.

A total of 3,030 acres (2,630 acres in the South Fork WSA and 400 acres in the Sand Hollow WSA) would be recommended nonsuitable for wilderness under this alternative.

Energy and Mineral Development Actions

Wilderness designation would close 24,512 acres (16,761 acres in the South Fork WSA and 7,751 acres in the Sand Hollow WSA) to mineral entry. If acquisition is successful, 880 acres of split-estate land (240 acres in the South Fork WSA and 640 acres in the Sand Hollow WSA) and the private inholdings (400 acres) would also be closed to mineral entry for a total of 25,792 acres. Surface disturbing exploration for oil and gas, bentonite and zeolites would be prohibited.

Exploration and development for oil and gas would be permitted on 3,030 acres within the nonsuitable area in the northern part of South Fork (2,630 acres) and western part of Sand Hollow (400 acres). Projected exploration and development would involve seismic surveys, drilling one well and construction of approximately one mile of access road and pipeline. Total surface disturbance would be six acres in the nonsuitable portion of the South Fork WSA.

Approximately 1,300 acres of an 1,800-acre area with high potential for semi-precious stones in the northern part of the South Fork WSA would be open to mineral entry. Exploration and development would likely involve surface examination, trenching and sampling. It is projected that two small open-pit mines would be developed. Along with an existing low level of activity on the remaining 18 claims, total surface disturbance would be 22 acres.

In the western portion of the Sand Hollow WSA, approximately 380 acres with high potential for bentonite and moderate potential for zeolites would be open to mineral entry. Exploration would likely involve surface examination and sampling. Due to large known deposits of bentonite and smaller deposits of zeolites elsewhere in the valley, it is unlikely that the deposits in the WSA would be developed.

Wildlife Habitat Management Actions

For both the South Fork and Sand Hollow WSAs, habitat would be managed to support maximum species diversity and populations in accordance with ODFW management goals and consistent with guidelines established in the BLM's Wilderness Management Policy. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing management plan and prescribed burning. Proposed projects in the Sand Hollow WSA include 3,500 acres of prescribed burning and 80 acres of juniper clearing by burning, if possible, but by hand thinning if necessary. In the South Fork WSA 8,000 acres of prescribed burning would be proposed. The prescribed burning is necessary to maintain the existing fire dependent ecosystem and would be allowed under wilderness designation. Any acreage burned by wildfire would replace on an acre-by-acre basis the acreage proposed for prescribed burning. The 80-acre juniper clearing is necessary to maintain an aspen stand and would also be allowed under wilderness designation since it would correct an unnatural condition resulting from human influence which could not be corrected by management alone. While 11,500 acres are proposed for prescribed burning, it is projected that only 1,000 acres would actually burn due to the existing lack of fire-carrying understory and management restrictions on burning during extreme fire condition periods.

Livestock Management Actions

For the area recommended as suitable for wilderness designation, livestock grazing use would remain at 1,452 AUMs (1,087 AUMs in the South Fork WSA and 365 AUMs in the Sand Hollow WSA). Vehicle use for day-to-day livestock management on 10.5 miles of ways and 7 miles of road would be precluded. Management of livestock and maintenance of 22.4 miles of fence would be conducted mainly from horseback. Mechanized heavy equipment would be used subject to permit, on the average of once every 10 to 15 years to maintain 19 reservoirs. Livestock forage is currently available but unallocated in the areas recommended as nonsuitable in both WSAs. However, livestock grazing use would remain at existing levels in the South Fork WSA since the nonsuitable land would be managed in common with suitable land. For the nonsuitable land in the Sand Hollow WSA, livestock grazing use would increase from 47 AUMs to 71 AUMs since this area is physically separated from the area recommended as suitable for wilderness. Riparian management fence would be constructed along 2.5 miles of Sulphur Creek in the nonsuitable portion of the South Fork WSA in conjunction with the juniper rip-rap (see watershed, below). One reservoir would be maintained by heavy equipment as needed.

Watershed Management Actions

In the portion of the South Fork WSA recommended as nonsuitable for wilderness, juniper rip-rap (i.e., using juniper cuttings for streambank stabilization) would be conducted along 1.5 miles of Sulphur Creek and 1,390 acres of juniper control would be conducted in the uplands for watershed improvement.

Recreation Management Actions

The entire 25,792 acres recommended as suitable for wilderness designation (17,401 acres in the South Fork WSA, assuming acquisition of the private inholdings, and 8,391 acres in the Sand Hollow WSA) would be closed to motorized vehicle use. A total of 10.5 miles of ways in the two WSAs, 6.4 miles of road between the two WSAs and 0.6 mile of dead-end road in the Sand Hollow WSA would be closed. Vehicle use is currently limited by ORV designation to these roads and ways. Current recreation use is estimated to be 4,500 visitor days per year, mostly utilizing vehicles on these roads and ways for access to hunting and fishing areas. A total of 1.5 miles of road and 2.9 miles of ways would remain open in the area recommended as nonsuitable for wilderness.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entirety of both WSAs nonsuitable for wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 28,422 acres (19,631 acres in the South Fork WSA and 8,791 acres in the Sand Hollow WSA) would be open to mineral entry.

A high potential for oil and gas in both WSAs would initially be explored by seismic surveys. Surface disturbance from the surveys would be negligible. Further exploration is projected to involve drilling two test exploration wells (one in each WSA) which would require construction of drill pads, mud pits and 2 miles of access roads. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. Five additional wells (three in Sand Hollow and two in South Fork) would be anticipated which would require 3 miles of access roads. Approximately 5 miles of pipeline would be constructed in the WSAs to market the gas. Total surface disturbance would be 30 acres in both WSAs.

Approximately 1,800 acres in the northern part of the South Fork WSA are determined to have high potential for semi-precious stones. Exploration and development would likely consist of surface examination, trenching and sampling. It is projected that three commercially valuable deposits would be discovered and three mines developed. Including the continued low level of activity on the other claims, total surface disturbance would be 23 acres under this alternative.

Approximately 540 acres in the western part of the Sand Hollow WSA have been determined to have high potential for bentonite deposits and moderate potential for zeolite deposits. Projected exploration would likely involve surface examination and sampling with negligible surface disturbance. Due to large known deposits of bentonite and smaller deposits of zeolites elsewhere in the valley, it is unlikely that these deposits in the WSA would be developed.

Wildlife Habitat Management Actions

For both the South Fork and Sand Hollow WSAs, habitat would be managed to support maximum species diversity and populations in accordance with

ODFW management goals. The primary manner in which habitat would be managed would be through close coordination with the livestock grazing management plan and vegetation manipulation. Western juniper and sagebrush communities would be selectively reduced by whatever means possible, including, but not limited to, prescribed burning, chaining and cutting, with prescribed burning being the preferred method. The goal is to provide for wildlife diversity. Proposed projects include 3,580 acres of vegetation manipulation and one guzzler in the Sand Hollow WSA and 8,000 acres of vegetation manipulation and two guzzlers in the South Fork WSA. Any acreage burned by wildfire would replace, on an acre-by-acre basis, acreage proposed to be treated by any method.

Livestock Management Actions

An additional 997 AUMs (550 AUMs in the South Fork WSA and 447 AUMs in the Sand Hollow WSA) of livestock forage currently available but unallocated would be allocated to livestock. This increase would involve 20,922 acres of the 28,422 acres in the two WSAs plus the portions of the pastures extending outside the WSAs. Livestock use in the South Fork Canyon would continue to be early spring, incorporating rest, to improve riparian vegetation.

Six reservoirs would be constructed in the South Fork WSA and one reservoir would be constructed in the Sand Hollow WSA to enhance forage production for livestock. As a result, an additional 500 AUMs (425 in the South Fork and 75 in Sand Hollow) would be allocated to livestock. Riparian fence would be constructed along 2.5 miles of Sulphur Creek in the South Fork WSA.

Vehicle use would continue on 13.4 miles of ways and 2.1 miles of road for the management of cattle and the maintenance of 20 reservoirs and 22.4 miles of fence. The roads are used about 20 times per year and the ways five to ten times per year to check livestock, spread salt and maintain facilities.

Watershed Management Actions

In the South Fork WSA, juniper rip-rap would be done intermittently along 2.5 miles of the South Fork of the Crooked River and along 2 miles of Sulphur Creek. Juniper clearing for upland watershed improvement and water production would be done on 2,190 acres, also in the South Fork WSA.

No watershed management actions are planned in the Sand Hollow WSA.

Recreation Management Actions

Vehicle use would continue on the existing 13.4 miles of ways and 2.1 miles of road. Current recreational use is estimated to be 4,500 visitor use days per year with most of this use utilizing the existing roads and ways for access for fishing and hunting.

Summary

Table 1 summarizes the projected management actions under each alternative.
Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Both WSAs generally appear to be in a natural condition and primarily affected by the forces of nature. Forty-three unnatural interior features (21 in the South Fork WSA and 22 in the Sand Hollow WSA) influence approximately 14 percent of these two WSAs. The area of influence is an estimate of the acreage from which these features can be seen.

Unnatural features in the South Fork WSA include 14.4 miles of fence, 13 reservoirs, 780 acres once seeded to crested wheatgrass, 1.5 miles of dead-end road and 9.4 miles of ways. Some disturbance associated with mining claims is also evident in the South Fork WSA. In the Sand Hollow WSA they include 8 miles of fence, 7 reservoirs, 320 acres once seeded to crested wheatgrass, 1,000 acres once sprayed to reduce sagebrush, 0.6 mile of dead-end road and 4 miles of ways. These features are dispersed throughout both WSAs except for the seeded areas which are located near the WSA boundaries and the mining claims, which are in the north part of the South Fork WSA..

Unnatural features outside of the South Fork WSA that affect its naturalness include boundary roads and evidence of rockhounding activities adjacent to the northern boundary road. Unnatural features outside of the Sand Hollow WSA that affect its naturalness include boundary roads, a woodpole utility line along the western and southern boundary, a 780-acre crested wheatgrass seeding, a mining operation west-southwest of the WSA, and a county material site adjacent to the northern boundary road. These features outside of both WSAs do not have a significant adverse effect on the naturalness of either WSA because they are generally screened from view by topography and/or vegetation. The only exception is an area below a basalt rim near the western boundary road of the Sand Hollow WSA from which all but the county material site can be seen.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The South Fork WSA has outstanding opportunities for a visitor to experience solitude. The size and shape of the WSA and the winding canyon of the South Fork and its tributaries along with scattered patches of juniper trees provide both topographic and vegetative screening. Opportunities to find a secluded spot are available in three portions of this WSA: the South Fork of the Crooked River canyon area, Twelvemile Table, and the Sulphur Butte area.

Although the Sand Hollow WSA is relatively small, it has outstanding opportunities for solitude due to dense clusters of juniper trees in some portions of the area, along with its shape and topography. Opportunities to find a secluded spot are available in the vicinity of Steens Ridge, in the central portion of the WSA.

Rockhounding activities adjacent to the South Fork WSA affect the area's ability to provide solitude in the area north and west of Sulphur Butte. Outside sights and sounds that affect the Sand Hollow WSA's ability to provide solitude are associated with traffic on boundary roads, grazing management and mining activities west of the WSA, and county material site activities adjacent to the northern boundary of the area. The impact of these sights and sounds on solitude in the Sand Hollow WSA is minor.

Outstanding opportunities for several types of primitive and unconfined recreational activities are available within the South Fork WSA: backpacking, camping, photography, nature study, hunting, fishing and horseback riding. An outstanding recreational activity is a hike along the meandering bottom of the South Fork of the Crooked River Canyon, where the feeling of solitude is strong.

The canyon's impressive geologic formations add to the scenic beauty and diversity of the WSA. Several side canyons such as Pickett Canyon also enhance the opportunity to hike and explore.

Several primitive and unconfined types of recreational activities are also available in the Sand Hollow WSA. These include hiking, camping, hunting, photography, nature study, sightseeing and horseback riding. However, they are less than outstanding due to a limited amount of diversity in wildlife, topography and vegetation. There are no unique points of interest to attract visitors to this area, or physical challenges available to visitors seeking this type of experience.

Special Features

While not geologically unique, the canyon of the South Fork of the Crooked River, including Pickett Canyon, contains outstanding scenery due to the canyon depth, jagged outcroppings of basalt and a variety of colors including lush green riparian vegetation along shallow pools of water in the canyon bottom. There is also crucial mule deer winter range in both WSAs and a small herd of wild horses that roams through much of the South Fork WSA (see Map 2).

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the WSAs are located in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe and sagebrush steppe with juniper. Of the vegetative communities listed in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan, the following occur in the WSAs: western juniper/big sagebrush/bluebunch wheatgrass; big sagebrush/bluebunch wheatgrass; low sagebrush/Idaho fescue; and western juniper/bluebunch wheatgrass (South Fork WSA only.)

There are seven standard metropolitan statistical areas with populations over 100,000 within five hours' driving time of the WSAs: Eugene/Springfield, Medford, Portland, and Salem Oregon; Richland/Kennewick/Pasco and Yakima, Washington; and Boise, Idaho.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by geologists with TERRADATA, a consulting firm under contract with BLM. Technical details of the evaluation are found in a TERRADATA report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Gerry Mountain Geologic Resource Area." This report is supplemented by a BLM evaluation of the same area.

The WSAs are within the Gerry Mountain geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral potential classifications for the WSAs. Map 5 shows where energy and mineral resources have moderate and high potential for occurrence in the WSAs.

Both WSAs are within an area of critical mineral potential (ACMP) for oil and gas. The exposed rocks in the WSAs are Tertiary and Quaternary volcanics and volcaniclastic sediments. The subsurface rocks are inferred from oil and gas exploration wells to include Cretaceous marine clastic sediments and PreCretaceous marine sediments and metamorphosed sediments. Depth of these sediments varies from 1,500 to 2,500 feet.

Energy Resources

Oil and gas has a high potential for occurrence based on several positive factors. Two deep exploratory wells have been drilled near the WSAs. Both wells had oil and gas shows and indicate that marine clastic sediments are probably present beneath both WSAs. Other exploratory wells have been drilled in Central Oregon, and all have had hydrocarbon shows. The combination of surface structures, subsurface geology, hydrocarbon shows and persistent exploration efforts all lead to high potential for occurrence of oil and gas in the South Fork and Sand Hollow WSAs.

As of October 16, 1987, approximately 8,610 acres within the WSAs were leased for oil and gas. There were no geothermal leases in either WSA as of October 16, 1987.

Mineral Resources

Known deposits of semi-precious gemstones (limb casts) occur within the South Fork WSA. The northern portion of the WSA has a high potential for the occurrence of semi-precious stones, and as of October 16, 1987, 20 mining claims covered this area. Eight of these claims are pre-FLPMA, located prior to October 21, 1976, and 12 are post-FLPMA, located on or after October 21, 1976. These claims are currently being developed at a low level by the claimants. Known deposits of bentonite and zeolites occur in the western portion of the Sand Hollow WSA. As of October 16, 1987, there were three mining claims for semi-precious stones in the Sand Hollow WSA. However, all of these claims are inactive and no known deposits of semi-precious stones exist in this WSA.

Vegetation

At present, the vegetation varies from west to east. Juniper-dominated rolling hills in the west, with patches of sagebrush and grass extend to the western rim of the South Fork of the Crooked River canyon. The rim overlooks a riparian zone of sedges, rushes,and bluegrass that grades into juniper and sagebrush communities on the canyon slopes. Beyond the eastern rim is Twelvemile Table which supports a low sagebrush/Idaho fescue community in late seral stage. The juniper/big and low sagebrush complexes are typically in mid-seral stage and encompass approximately 17,000 acres. Other common plants in the upland communities include bitterbrush, currant, rabbitbrush, bluebunch wheatgrass, Thurber's needlegrass, Sandberg's bluegrass, phlox, buckwheat and wild onion. Two areas of crested wheatgrass seeding totaling 1,100 acres, are within the WSAs. One aspen community, severely invaded by juniper, exists in the north part of Sand Hollow WSA.

There are no known threatened or endangered plant species in the WSAs.

Most of the WSAs consist of a historically fire-dependent ecosystem. Frequent wildfires maintained the sagebrush and juniper components at a level less than at present. Through grazing practices, which eliminated some of the fine fuels (i.e., grasses and forbs) needed to carry wildfire and through modern day wildfire suppression, wildfire is no longer a common occurrence in the WSAs. As a result, the shrub and tree components of the ecosystem have increased dramatically, decreasing the grass and forb component, and further reducing the occurrence of substantial wildfire.

Wildlife

Habitat conditions for wildlife are influenced by the diversity of vegetation types and the ecological status of those types. In these WSAs, the ecological status has been significantly influenced by the control of fire and/or livestock grazing. Although the ecological condition is generally mid- or late seral, there is little diversity in age structure. As a result, the wildlife habitat condition is considered as high fair. More frequent fires, or similar disturbances, would reduce the tree/shrub canopy and promote areas of quality forage. A lack of fire has led to an ecological status which favors trees and shrubs and allows those species to exert an increasing influence on habitat conditions. The longer this situation continues, the more the cover component increases and the more the forage component decreases and the overall wildlife habitat conditions decline.

Both WSAs provide habitat for mule deer, antelope and elk. Low to moderate levels of waterfowl and shorebird nesting habitat are provided by intermittent lakes and reservoirs. Ferruginous hawks and Swainson's hawks, both federal candidate species, are known to occur in the WSAs with use mainly in areas where tree canopy cover is low.

While antelope occur in both WSAs except in winters with normal or greater snowpack, the South Fork WSA receives the majority of antelope use, particularly the eastern half which is a major travel corridor. Antelope fawning also occurs in this part of the WSA. The South Fork WSA also receives the majority of mule deer and elk use, rated moderate and low respectively. Historical levels of mule deer use are higher than present levels and elk use is increasing.

Bald eagles, a threatened species in Oregon, frequent the South Fork WSA in winter and during migrations, but no major use areas have been documented. Sage grouse, a federal candidate species, also is known to occur in the WSA.

The South Fork of the Crooked River provides a large area of specialized habitat. Presently fenced to manage the canyon for riparian habitat, the area also supports bobcats, golden eagles, prairie falcons, beaver, waterfowl, chukar and a variety of other species.

Although not as important to wildlife as the South Fork WSA, the Sand Hollow WSA does have a large aspen stand in the north which provides some important wildlife diversity for the area.

Watershed

There are no perennial streams in the Sand Hollow WSA. The South Fork WSA contains 9 miles of stream. Both the South Fork of the Crooked River (7 miles) and Sulphur Creek (2 miles) are perennial. Water quality and riparian habitat conditions are generally good and improving along the South Fork. Water quality and streambank stability are degraded and heavily impacted by livestock on Sulphur Creek. Sulphur Creek and other areas are heavily wooded with juniper. These trees have effectively out-competed other upland vegetation. As a result, there is little herbaceous ground cover to slow rainwater or snowmelt. The tendency then is for water to run down hillsides and carry with it soil, causing sheet (surface) and gully erosion. Removal of juniper on these sites results in an increase in herbaceous ground cover which improves the watershed condition.

Livestock Grazing

Portions of four allotments are in the South Fork WSA and portions of two are in Sand Hollow WSA. All public lands in the WSAs are under permit for livestock grazing. Table 4 summarizes existing livestock use in AUMs.

Existing livestock developments in the South Fork WSA include 14.4 miles of fence, 13 reservoirs and 780 acres of crested wheatgrass seeding. Sand Hollow WSA has eight miles of fence, seven reservoirs, 320 acres of seeding, and 1,000 acres once sprayed to reduce sagebrush.

Livestock operators use motor vehicles on the roads approximately 20 times per year and on the ways five to ten times for fence and reservoir inspection and maintenance, to check livestock and spread salt. Cattle are moved from pasture to pasture with saddle horses because of topography and lack of vehicle access.

Cultural Resources

The western boundary of the Sand Hollow WSA corresponds to the Stein's Military Road, a route dating from 1859-60 that originated at Fort Dalles and headed south and east across Oregon. This road is thought to overlay the Meek's Wagon Train route of 1845. It is not known whether there is currently any evidence of these routes on the ground. Two prehistoric lithic scatters have been recorded in the South Fork WSA, where people camped and made stone tools. There is excellent potential in both WSAs for discovering additional prehistoric and historic sites.

Paleontological Resources

Based on known fossil localities in the area, there is some potential for limited paleontological resources in the northern portions of both WSAs and in the western portion of the Sand Hollow WSA.

Recreation Use

Recreation use of both WSAs includes backpacking, day hiking, fishing, hunting, rockhounding, bird watching, camping, horseback riding, sightseeing and photography. Use of vehicles is limited to existing roads and ways. Vehicles are used to get to hunting camps, to get close to the rim of the South Fork canyon for fishing and to get to rockhounding spots.

Overall recreation use in the WSAs amounted to approximately 3,000 visitor days per year in 1979 and is currently increasing by two to five percent per year. Fishing use has increased significantly since the South Fork Crooked River was stocked with fish in 1982, increasing total recreation use to an estimated 4,500 visitor days per year.

Local Personal Income

Livestock use at the current level of 1,648 AUMs and recreation use totaling 4,500 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $20,000 for livestock grazing and $54,000 related to recreation use of the WSA, for an overall total of $74,000. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness:
South Fork WSA: 19,631
Sand Hollow WSA: 8,791

Recommended nonsuitable for wilderness:
South Fork WSA: 0
Sand Hollow WSA: 0

Impacts on Wilderness Values

Wilderness values within the entire 19,631 acres of the South Fork WSA and entire 8,791 acres of the Sand Hollow WSA would be protected by legislative mandate through wilderness designation. Wilderness values of naturalness, solitude, and primitive, unconfined recreation would be preserved. Special features including the South Fork of the Crooked River and the small herd of wild horses would also be protected.

Naturalness

The South Fork of the Crooked River Canyon and its tributaries, Twelvemile Table, Sulphur Butte, Steens Ridge, and other natural-appearing areas within both WSAs (about 89 percent of both WSAs is pristine, uninfluenced by any unnatural features), would be enhanced by prohibiting motorized vehicle use. Closure of 9.4 miles of ways within the South Fork WSA and 4 miles of ways in the Sand Hollow WSA, which influence approximately 1,900 acres (6.7 percent of the combined acreage of both WSAs) would allow the ways to revegetate. Approximately 7.5 miles of ways throughout the South Fork WSA and 4 miles of ways in the southern portion of the Sand Hollow WSA which access reservoirs would receive periodic use every 10-15 years, subject to permit, to provide for maintenance by heavy equipment. Disturbance to naturalness would be very limited since such infrequent use would allow the ways to revegetate.

A low level of mineral development associated with 20 existing mining claims in the north part of the South Fork WSA would directly affect 20 acres and indirectly affect naturalness on 100 acres. Mineral exploration activities on 240 acres of split-estate lands in the southern portion of the South Fork WSA and 700 acres of split-estate lands in the western and southern portions of the Sand Hollow WSA would temporarily reduce naturalness, but required reclamation would result in generally unnoticeable surface disturbance. Development would not be expected.

Prescribed burning of 700 acres in the South Fork WSA and 300 acres in the Sand Hollow WSA, and treatment of 80 acres of juniper in an aspen stand in the Sand Hollow WSA would be noticeable in the short term. However, these treatments would eventually improve naturalness through restoration of a fire-dependent ecosystem and an aspen community.

Solitude

Opportunities for solitude provided by the size of both WSAs, over 8 miles of winding canyons within the South Fork WSA and limited vehicle access would be further enhanced by eliminating motorized use on 9.4 miles of ways in the South Fork WSA and 4 miles of ways in the Sand Hollow WSA. Vehicles would be limited to the boundary roads and one dead-end road within each WSA. This reduction in vehicle access would provide a large area for visitors to hike into and experience solitude without disturbance from motorized vehicles.

Solitude would be reduced on 1,080 acres where removal of juniper and/or sagebrush would occur. However, since these actions are anticipated to encompass several smaller areas, impacts to solitude in the WSAs is expected to be negligible.

Primitive and Unconfined Recreation

Closure of 9.4 miles of ways within the South Fork WSA and 4 miles of ways within the Sand Hollow WSA would increase opportunities for primitive and unconfined recreation activities such as hiking, hunting, fishing and backpacking. The quality of wildlife observation and photography experiences would be improved by removing vehicles and rehabilitating vehicle ways. A more natural and primitive setting would be provided.

Special Features

Eliminating motorized vehicle use on a total of 13.4 miles of vehicle ways within both WSAs would reduce impacts to special features by minimizing disturbance to the small herd of wild horses.

Conclusion: Wilderness designation of the entire 19,631 acres within the South Fork WSA and 8,791 acres within the Sand Hollow WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 27,482 acres within the WSAs to mineral entry. The 940 acres of split-estate in the WSAs would be open to mineral exploration. Low-level development of existing mining claims would be expected to continue.

Energy Development

Surface-disturbing exploration and development of oil and gas in the WSAs would be prohibited on 27,482 acres. Projected development of seven production wells (three in South Fork WSA and four in Sand Hollow WSA) would be precluded. The split-estate land would be open to energy exploration but development on this land would not be expected.

Conclusion: Production from seven projected oil and gas wells would be foregone.

Mineral Development

Surface-disturbing exploration for semi-precious stones on 1,800 acres in the South Fork WSA would be precluded and projected development of three small deposits would not occur. A low level of development on 20 existing claims would continue and affect 20 surface acres in the long term. Due to other known deposits of bentonite and zeolites in adjacent areas, only casual exploration without surface disturbance or development is expected on the 540 acres in the Sand Hollow WSA.

Conclusion: The likely development of three small deposits of semi-precious stones would be precluded. No impact to bentonite/zeolite production is expected.

Impacts on Vegetation

Since the proposed grazing allocation increase would not be allowed under the all wilderness alternative, based upon its potential impacts to wilderness values, existing management, prescribed burning and natural succession would have the greatest effect on vegetation. For 1,000 acres treated by prescribed fire, the ecological status would rapidly change from mid-seral to late seral stage, and the residual ground cover would increase. For those areas unburned (approximately 16,000 acres), the ecological status would slowly change from mid-seral to early seral stage as shrub and tree cover increased and herbaceous cover decreased. The low sagebrush communities in late seral stage would have a static or downward trend, but would not change significantly in the long term. The removal of 80 acres of juniper would revitalize an aspen stand that is currently dying. In the long term, livestock utilization would remain at approximately 35 percent.

In the South Fork WSA, riparian vegetation along 7 miles of the South Fork of the Crooked River would continue to improve due to specialized early spring and rest grazing treatments being practiced. The ecological status would reach its potential natural community of sedge/grass/clumped willows. Heavy utilization along two miles of Sulphur Creek would continue with no improvement occurring to riparian vegetation.

Once closed to vehicles, the 13.4 miles of ways, totaling 13 acres, would begin to revegetate within approximately two growing seasons. Mining activity on 20 claims would impact up to 20 acres in the long term.

Conclusion: Riparian vegetation along the South Fork of the Crooked River would continue to improve while poor riparian vegetation along Sulphur Creek would not change. The 13.4 miles of ways would revegetate. Most of the uplands would slowly change from mid-seral toward early seral stage, except for 1,000 acres which would rapidly change as a result of prescribed burning. An aspen stand would be revitalized.

Impacts on Wildlife

Wildlife habitat quality, especially for deer, elk and antelope, would be slightly reduced in the long term as a result of the existing western juniper and sagebrush dominance on the majority of the WSAs. Some improvement in condition would be realized as a result of prescribed burning (700 acres in the South Fork WSA and 300 acres in the Sand Hollow WSA) and removal of juniper in an aspen stand (80 acres). Condition would continue to decline in the long term due to this limited amount of habitat alteration. With none of the 997 AUMs of available forage being allocated to livestock, unallocated forage levels would exceed the level identified to meet ODFW population goals for big game. In the long term this forage level would decrease as mentioned above, due to an increasing cover component. Big game populations discussed in the Interrelationships section would remain stable in the long term. If wildfire assumes its historic role, cover-to-forage ratios would decrease and big game populations would increase. Residual forage for nesting and escape cover would be maintained.

Wildlife habitat would be enhanced by closing 13.4 miles of ways in the WSAs. This would increase habitat security, primarily for big game, but also for bird species including the raptors and sage grouse.

Wildlife habitat would be maintained by not allowing surface-disturbing mineral exploration or development.

Conclusion: An increase in cover to forage ratios resulting from increasing juniper and shrub dominance would have long-term impacts on wildlife. Burning of some areas would result in enhancement of habitat for those areas burned. Wildlife habitat security would also be enhanced from closure of 13.4 miles of ways. Big game populations would remain stable.

Impacts on Watershed

For the South Fork WSA, the early spring and rest grazing management being practiced in the South Fork of the Crooked River canyon would continue to improve water quality and quantity along 7 miles of the river. A reduction in streambank trampling and restoration of streambank vegetation would continue, resulting in greater streambank stabilization, less sedimentation and increased water flow. Water temperatures would be reduced slightly and fecal coliform bacteria from cattle would be reduced, resulting in improved water quality.

Upland sites subjected to prescribed burning would be more stable in the long term. Watershed conditions would be increasingly less stable on sites not burned, including the Sulphur Creek watershed, since long-term change in ecological status away from PNC would occur.

Conclusion: Improved quality and quantity of water and streambank stabilization would occur along the South Fork of the Crooked River. Watershed conditions along Sulphur Creek and on 17,000 upland acres would continue to decline.

Impacts on Livestock Grazing

Livestock use would remain at the current use levels of 1,236 AUMs in the South Fork WSA and 412 AUMs in the Sand Hollow WSA. Wilderness designation would preclude the allocation of an additional 997 AUMs of currently available but unallocated forage (550 AUMs in the South Fork WSA and 447 AUMs in the Sand Hollow WSA) because of the potential adverse impact on the area's naturalness. (An additional allocation of 997 AUMs would cause greater utilization of existing vegetation resulting in a more grazed appearance, less residual ground cover and increased trampling.) Increases would not be allowed in pastures entirely or partially within the wilderness area. Another 500 AUMs would be foregone (425 AUMs in the South Fork and 75 AUMs in Sand Hollow) since construction of seven reservoirs would be precluded.

Vehicle use for livestock management and facility inspection/maintenance on 13.4 miles of ways in both WSAs would be precluded, resulting in inconvenience and slight additional expense to livestock operators. Much of the area is presently inaccessible and livestock management is accomplished by horseback. Heavy equipment would be used, subject to permit, once every 10 to 15 years for maintenance of 20 reservoirs. This periodic and infrequent use would involve using 6.5 miles of ways and approximately one mile of cross-country travel.

Conclusion: A potential allocation of 1,497 AUMs of currently available forage and forage made available through reservoir construction would be foregone. Vehicle use of 13.4 miles of ways would be precluded with some inconvenience and slight increase in cost to livestock operators.

Impacts on Recreation Use

Vehicular access to the rim of the South Fork of the Crooked River Canyon would be eliminated due to the closing of several ways. Anglers would have to walk up to 3 miles from an existing road to get to a good place to hike down from the rim to the river, and hunters would have a more difficult time scouting the area for game animals. However, the quality of fishing and hunting would increase as a result of the way closures. While hiking and other primitive recreation activities would increase, in the South Fork WSA there would be a reduction in visitor use up to 100 visitor days per year.

Rockhounding would be difficult since it would be hard to carry tools and finds a long distance. However, as the public becomes aware of the area's wilderness qualities and outstanding primitive recreation opportunities, increased visitation from wilderness users would be expected to offset the decrease in rockhounding and fishing use levels.

There would be a slight initial reduction in recreation use in the Sand Hollow WSA, primarily related to restrictions on vehicle use for hunting access. Primitive recreation activities would be expected to increase somewhat and would eventually offset decreases in existing levels of use.

Conclusion: The area's recreation use level of approximately 4,500 visitor days per year, which has been increasing with an annual rate of two to five percent, would be expected to decrease by approximately 150 visitor days per year in the short term but then continue to increase by two to five percent per year in the long term. Wilderness designation would result in a change to primitive, nonmotorized types of recreation use which would partially offset the reduction in visitor use in the long term.

Impacts on Local Personal Income

Livestock grazing would remain at 1,648 AUMs. Overall recreation use would decrease by 150 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $1,800 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $1,800.

Enhanced Wilderness (Proposed Action)

Recommended Suitable for Wilderness:
South Fork WSA: 17,001 acres (17,401 assuming acquisition of the 400 acres of private land)
Sand Hollow WSA: 8,391 acres

The two WSAs would be combined for a total of 25,392 acres (25,792 assuming acquisition of the 400 acres of private land)

Recommended nonsuitable for wilderness:
South Fork WSA: 2,630 acres
Sand Hollow WSA: 400 acres

Impacts on Wilderness Values

The enhanced wilderness alternative would combine portions of both WSAs and add 25,792 acres to the NWPS, assuming acquisition of 400 acres of private land in the South Fork WSA. The mineral estate on 880 acres of split-estate lands would also be acquired. There would be 10.5 miles of ways closed to vehicle use as well as 6.4 miles of bladed road between the WSAs and 0.6 mile of dead-end reservoir access road in the Sand Hollow WSA. Most of the South Fork and Sand Hollow WSAs would be designated wilderness, and wilderness values in these two areas would be protected by legislative mandate.

Wilderness values of naturalness, solitude, and primitive and unconfined recreation would be preserved. Special features including the South Fork of the Crooked River Canyon, riparian habitat, northern bald eagle habitat and the small herd of wild horses would also be protected. Acquisition of 880 acres of subsurface mineral estate and 400 acres of private land would prevent possible disturbance from mineral exploration and ensure the preservation of naturalness and opportunities for solitude and primitive recreation.

The remaining 3,030 acres of the areas recommended nonsuitable for wilderness would not receive special legislative protection. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be vulnerable to the effects of other resource management actions, including energy and mineral exploration, development of two deposits of semi-precious stones, a low level of development on 20 existing mining claims and continued vehicle use on 2.9 miles of ways.

Naturalness

For the 25,792 acres recommended suitable for wilderness, the effects on naturalness would be similar to the all wilderness alternative except the enhanced alternative would include the acquisition of 400 acres of private land and 880 acres of mineral estate and the closure of 0.6 mile of dead-end road and 6.4 miles of boundary road between the WSAs.

The acquisition of the private land and mineral estate would preclude surface disturbance from mineral entry and exploration. Closing the 7 miles of road would allow revegetation of 14 acres and prevent their unnatural influence on approximately 1,100 acres.

Closing of 10.5 miles of ways would allow revegetation of ten acres and eliminate their unnatural influence on approximately 1,600 acres.

Prescribed burning of 700 acres in the South Fork WSA and 300 acres in the Sand Hollow WSA, and removal of 80 acres of juniper in an aspen stand in the Sand Hollow WSA would be apparent in the short term. However, these treatments would eventually improve naturalness through restoration of a fire-dependent ecosystem and an aspen community.

Within the South Fork and Sand Hollow WSAs 2,630 acres and 400 acres, respectively, would be recommended nonsuitable for wilderness. Although wilderness values in these areas are already affected by outside sights and sounds and by mining claims these values would be vulnerable to the effects of projected management actions. These actions would be expected to include development of one oil and gas well, access road and pipeline (totaling six acres of surface disturbance), two small semi-precious gem stone mines directly affecting four acres and influencing approximately 100 acres, continued low-level development of 18 other existing mining claims directly affecting naturalness on up to 18 acres and influencing 80 acres, 1,390 acres of juniper control, 1.5 miles of juniper rip-rap and 2.5 miles of riparian fence, both on Sulphur Creek, influencing a total of 50 acres. These areas are generally screened from the suitable portions of the WSAs due to topography and vegetation. The allocation of 24 AUMs of existing but unallocated livestock forage in the nonsuitable portion of the Sand Hollow WSA would have a slight adverse effect on naturalness. This area is already in an unnatural appearing condition since it consists of a crested wheatgrass seeding.

Solitude

For the area recommended suitable for wilderness the effects on solitude would be similar to the all wilderness alternative except closure of the road between the WSAs would greatly enhance the opportunities for solitude in these areas that presently have marginal opportunities. Closing 0.6 mile of dead-end road and precluding mineral entry and surface-disturbing exploration on the 1,280 acres of non-Federal mineral estate and private land would also increase opportunities for solitude.

Designation of 25,472 acres as wilderness would result in closure of 10.5 miles of ways which would reduce the amount of vehicle access and the adverse impacts of vehicle use on solitude.

In the 3,030 acres recommended nonsuitable for wilderness, continued vehicle use on 2.9 miles of ways and human activities associated with energy and mineral development and livestock facility inspection and maintenance would cause repeated local impairment of opportunities for solitude within and adjacent to the areas where these activities would occur.

Primitive and Unconfined Recreation

Within the area recommended suitable for wilderness, the same increased opportunities for primitive and unconfined recreation as in the all wilderness alternative, resulting from closure of ways, would occur. In addition, closure of 6.4 miles of boundary road between the WSAs to motorized vehicle use and combining the two WSAs into one wilderness area would result in increased opportunities for primitive and unconfined recreation activities such as backpacking, camping, hunting, fishing, photography, nature study and horseback riding. The quality of these experiences would be improved by removing vehicles and rehabilitating these vehicle access routes, resulting in a more natural appearing area. The acquisition of 880 acres of non-Federal mineral estate and 400 acres of private inholdings would preclude mineral entry and exploration thus preserving a natural setting for primitive recreational pursuits.

Vehicle use would continue on the 2.9 miles of ways and 2 miles of roads within the 3,030 acre area recommended nonsuitable for wilderness, and would continue to intrude upon primitive, nonmotorized recreation opportunities in that area.

Special Features

The impacts to the small wild horse herd (less disturbance from vehicles) would be similar to the impacts identified in the all wilderness alternative, but would be enhanced by the acquisition of 880 acres of split mineral estate and 400 acres of private land. Mineral entry and surface-disturbing exploration would be precluded in the South Fork of the Crooked River canyon through acquisition of private land.

Conclusion: Wilderness designation of 17,401 acres within the South Fork WSA and 8,391 acres within the Sand Hollow WSA (total acreage of 25,792 acres) would protect and enhance existing wilderness values. The acquisition of 880 acres of mineral estate would further enhance the area recommended as suitable by preserving wilderness values on all lands within the proposed wilderness boundary.

Although wilderness values are limited within the 3,030-acre area recommended as nonsuitable for wilderness, projected energy and mineral activities including wells and mines, and livestock, watershed and wildlife projects, would impair wilderness values on 1,500 acres in this area with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 25,792 acres to energy and mineral entry, assuming acquisition of the 400 acres of private land, and the mineral estate of split-estate lands totaling 240 acres in the South Fork WSA and 640 acres in the Sand Hollow WSA. The remaining 3,030 acres would be open for energy and mineral entry.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 25,792 acres by wilderness designation. Projected development of six production wells would be precluded. One projected well would be drilled in the area recommended nonsuitable.

Conclusion: Production from six projected wells would be foregone. One well would be projected to be developed.

Mineral Development

Wilderness designation would preclude mineral entry and development of one small open pit mine for semi-precious stones in 500 acres of the South Fork WSA. In the western part of the Sand Hollow WSA, wilderness designation would preclude exploration for bentonite and zeolites on 160 acres.

Approximately 1,300 acres would be open to mineral entry for semi-precious stones in the South Fork WSA, and projected productions from two small open pit mines would occur. In the western part of the Sand Hollow WSA, approximately 380 acres would be open for entry. However, only casual exploration, without development, would be expected since other deposits of bentonite and zeolites are known to occur in adjacent areas.

Conclusion: Projected production from one small deposit of semi-precious stones would be foregone. Two mines would be projected to be developed. No impact is expected to bentonite or zeolite production.

Impacts on Vegetation

Since proposed grazing allocation increases would not be allowed on land recommended as suitable for wilderness, based on the possible impairment of wilderness values, the existing management, prescribed burning and natural succession would have the greatest effect on vegetation in the area.

Vegetation on 1,000 acres would change rapidly from mid-seral stage to late seral stage due to burning, and an aspen stand would be rejuvenated when competing junipers were removed from 80 acres. The remaining acreage in mid-seral stage (approximately 16,000 acres) would slowly change to early seral stage as shrub and tree canopies increased. Low sagebrush communities in late seral stage would show a slight change toward mid-seral stage, but would not change substantially. Utilization would remain at approximately 35 percent and residual ground cover would increase in burned areas and decrease in unburned areas. Riparian vegetation on the South Fork Crooked River would continue to change toward PNC.

The closure of 10.5 miles of ways and 7 miles of road, totaling 24 acres, would allow revegetation to begin within approximately two growing seasons.

With acquisition of the mineral estate on two parcels (880 acres) of split-estate land, and the acquisition of the 400 acres of private inholdings, any future exploration and resulting disturbance to vegetation on these lands would be precluded.

On 400 acres in the Sand Hollow WSA recommended nonsuitable for wilderness, 24 AUMs of currently available but unallocated forage would be allocated with a corresponding decrease in residual cover. Utilization of key forage species in this area would increase from 35 percent to 45 percent. On land recommended nonsuitable for wilderness in the South Fork WSA, juniper clearing on 1,390 acres would remove juniper and release understory forbs, grasses and shrubs. Ecological status would change rapidly toward late seral stage on these acres. The construction of 2.5 miles of riparian management fence along Sulphur Creek would allow special grazing treatments that would promote establishment of sedges and rushes and provide residual streamside vegetation. Juniper rip-rap along this same creek would affect 20 acres through juniper removal. Energy and mineral development would result in 30 acres of vegetation disturbance.

Conclusion: For land recommended suitable for wilderness, seral status would change on 1,080 acres as a result of vegetation treatment, and revegetation would occur on 17.5 miles of ways and roads. Riparian vegetation would continue to improve on the South Fork of the Crooked River. In the portion of the WSAs recommended nonsuitable for wilderness, seral status would change on 1,390 acres through vegetation treatment and riparian vegetation along Sulphur Creek would improve. Energy and mineral development would disturb 30 acres.

Impacts on Wildlife

As in the all wilderness alternative, wildlife habitat quality, especially for deer, elk and antelope, would be slightly reduced in the long term as a result of the existing western juniper and sagebrush dominance on the majority of the WSA (approximately 16,000 acres). Some limited improvement in condition would be realized as a result of prescribed burning (700 acres in the South Fork WSA and 300 acres in the Sand Hollow WSA) and removal of juniper in an aspen stand (80 acres). Habitat condition would continue to decline in the long term due to this limited amount of habitat alteration. With only 24 of the proposed 997 AUMs of available forage being allocated to livestock, unallocated forage levels would exceed the level identified to meet ODFW population goals for big game. In the long term this forage level would decrease due to an increasing cover component. Big game populations discussed in the Interrelationships section would remain stable in the long term. If wildfire assumes its historic role, cover-to-forage ratios would decrease and big game populations would increase. Residual forage for nesting and escape cover would be maintained.

Wildlife habitat would be enhanced by closing 10.5 miles of ways in the WSAs. This would increase habitat security primarily for big game, but also for bird species including the raptors and sage grouse. Wildlife habitat would be maintained by not allowing surface-disturbing mineral exploration or development in the area recommended suitable for wilderness.

In addition to these impacts, the enhanced alternative would provide additional protection to wildlife habitat and wildlife populations by precluding any future surface-disturbing mineral exploration on 880 acres of split-estate lands, if acquired, and by precluding any future vehicle disturbance to wildlife on 400 acres of private property, if acquired. Closure of the road between the two WSAs (6.4 miles) would decrease habitat disturbance for big game as well as for species which utilize the reservoirs and intermittent lake along this road.

For the area recommended nonsuitable for wilderness, habitat quality, primarily for deer, antelope and elk, would be improved on 1,390 acres through juniper thinning, and riparian habitat would be improved on Sulphur Creek through juniper rip-rap and fencing. Wildlife would continue to be disturbed from motor vehicle use on existing ways and from any future energy or mineral development or exploration.

Conclusion: Due to overall habitat diversity, an increase in cover-to-forage ratios resulting from increased juniper and shrub dominance would continue to have negligible impacts on wildlife. Prescribed burning of 1,000 acres would result in significant benefits to big game. Wildlife would also benefit from closure of 7 miles of road and 10.5 miles of ways, and from precluding human activity on an acquired 880 acres of split-estate and 400 acres of private inholdings.

Impacts on Watershed

Spring and rest grazing treatments for the South Fork of the Crooked River and Sulphur Creek would result in an improvement of water quality and quantity. There would be a reduction of streambank trampling, which in turn would result in greater streambank stabilization, less sedimentation and increased vegetation. Fecal coliform bacteria from cattle would be greatly reduced. Juniper rip-rap along Sulphur Creek would speed these processes.

Upland watershed stability would improve within the 1,390-acre juniper clearing area and in areas where prescribed burning was successful (1,000 acres). This would be due to an increased herbaceous component in the vegetation, resulting in less surface runoff of water and less erosion. Upland conditions would decline on untreated lands (16,000 acres).

Conclusion: Water quality and quantity and streambank stability would improve along the South Fork of the Crooked River and Sulphur Creek. Upland watershed stability would improve on 2,470 acres and decline in the long term on 16,000 acres.

Impacts on Livestock Grazing

In the area recommended suitable for wilderness, livestock allocations for both WSAs would continue at current levels. Wilderness designation would preclude the allocation of 973 AUMs of currently available but unallocated forage in affected pastures because of the potential adverse impacts upon the area's naturalness. An additional allocation of 973 AUMs would cause greater utilization of existing vegetation resulting in a more grazed appearance, less residual ground cover and increased trampling. Increases would not be allowed in pastures entirely or partially within the wilderness area. An additional 500 AUMs (425 AUMs in the South Fork and 75 AUMs in Sand Hollow) would be foregone since construction of seven reservoirs would be precluded.

Vehicle use for livestock management and facility inspection/maintenance on 10.5 miles of ways and 7 miles of roads would be precluded, in both WSAs, resulting in inconvenience and a slight additional expense to livestock operators. Much of the area is presently inaccessible, and livestock management is currently accomplished by horseback. Heavy equipment would be used, subject to permit, once every 10 to 15 years for maintenance of 19 reservoirs. This periodic, infrequent use would involve 5.5 miles of ways and one mile of cross-country travel.

In the area recommended nonsuitable for wilderness, the existing roads and ways would continue to be used by livestock operators for periodic inspection and maintenance of one reservoir and fences.

Livestock use in the Sand Hollow WSA would increase by 24 AUMs.

Conclusion: A potential allocation of 1,473 AUMs of currently available but unallocated forage and forage made available from reservoir construction would be foregone; 24 additional AUMs would be allocated. Vehicle use on 10.5 miles of ways and 7 miles of roads would be precluded, resulting in some inconvenience and additional expense to livestock operators.

Impacts on Recreation Use

A decrease in recreation opportunities dependent on motorized access would occur under this alternative. However, an increase in primitive recreation would occur as a result of closing seven miles of road in addition to 10.5 miles of ways to vehicle traffic. While anglers would have to walk an additional 2 miles to the Crooked River Canyon rim and hunters would also have to walk farther, the quality of these activities would increase. Some rockhounds would find it more difficult to get to their favorite rockhounding area, but access to the main rockhounding area would not be affected. As the public became aware of the area's wilderness qualities, increased visitation from wilderness users would nearly offset the decrease in hunters and anglers. In addition, acquisition of the mineral estate on 880 acres of split-estate land and acquisition of the 400 acres of private inholdings would prevent surface-disturbing mineral exploration, development, and other similar activities, preserving a natural setting for primitive recreational pursuits. There would be a net decrease in overall recreation use, from 4,500 visitor days to 4,000 visitor days per year.

Conclusion: The area's current recreation use level of 4,500 visitor days per year, which has been increasing at an annual rate of two to five percent would have a net decrease of 500 visitor days per year. There would be a change from recreationists using motorized equipment to primitive, nonmotorized types of recreation use.

Impacts on Local Personal Income

Livestock grazing would increase by 24 AUMs. Overall recreation use would decrease by 500 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $5,712 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $5,700.

No Wilderness/No Action

Recommended suitable for wilderness:
South Fork WSA: 0 acres
Sand Hollow WSA: 0 acres

Recommended nonsuitable for wilderness:
South Fork WSA: 19,631 acres
Sand Hollow WSA: 8,791 acres

Impacts on Wilderness Values

Under this alternative, none of the 19,631 acres within the South Fork WSA or 8,791 acres within the Sand Hollow WSA would be designated wilderness, and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation and the special features would be subject to the effects of projected management actions. Projected actions include energy and mineral exploration, the development of an estimated seven wells and three small mines, continued low-level development of 17 mining claims, continued vehicle use limited to existing roads and ways for livestock management and recreation use, an allocation of 997 AUMs of existing but currently unallocated livestock forage and 500 AUMs of forage made available from reservoir construction, 2,190 acres of juniper control, 2.5 miles of riparian fence, 4.5 miles of juniper rip-rap, construction of seven reservoirs and three wildlife guzzlers, and prescribed burning or other treatment of 11,580 acres of sagebrush and juniper.

Naturalness

Continued vehicle use on the 13.4 miles of ways, 2.1 miles of dead-end road and 6.4 miles of boundary road between the WSAs would continue the impact of vehicles upon naturalness on approximately 3,100 acres (11 percent of the combined acreage of both WSAs). Most of this influence upon the area's naturalness would occur on or adjacent to the boundary road between the WSAs. Short and long-term impacts to naturalness would result from three projected small mines involving six acres of direct surface disturbance and influencing 150 acres, continued low-level development of 17 mining claims disturbing 17 acres and influencing 70 acres, projected oil and gas activities (including seven wells, five miles of road and underground pipeline) directly affecting 32 acres and visually affecting 500 acres, seven livestock reservoirs and three wildlife guzzlers. The reservoirs and guzzlers would directly affect 16 acres and visually influence 200 acres. The allocation of an additional 997 AUMs of existing but unallocated livestock forage would increase trampling around water sources and increase the utilization of forage, resulting in a more grazed appearance with a reduced amount of residual ground cover.

Construction of 2.5 miles of riparian fence and 4.5 miles of juniper rip-rap would improve naturalness on 4.5 miles of riparian area in the long term by helping to restore the riparian habitat. The fence would add an unnatural feature influencing approximately 200 acres within the immediate vicinity.

The 2,190 acres of juniper control and 11,580 acres of juniper and sagebrush control would be noticeable in the short term but in the long term this would lead to the restoration of a fire-dependent ecosystem with an increase in the natural components of grass and ground cover resulting in less soil erosion.

Solitude

Human activity associated with energy and mineral development, prescribed burning or other treatment of vegetation and continued motorized vehicle use on 13.4 miles of ways and 2.1 miles of roads would cause repeated local impairment of solitude opportunities adjacent to the activity. Vehicle use primarily occurs on the road between the WSAs. Opportunities for solitude would remain in the South Fork of the Crooked River canyon, its tributary canyons and in other unroaded areas.

Primitive and Unconfined Recreation

The projected activities described in the previous section (solitude) would also reduce primitive, nonmotorized recreation opportunities within and adjacent to the area of activity. Construction of the riparian fence, three guzzlers, and 4.5 miles of juniper rip-rap would improve opportunities for primitive and unconfined recreation associated with riparian and wildlife enhancement, such as bird watching, hunting and camping in a generally natural setting.

Special Features

Projected energy and mineral development, vegetation treatment activities and vehicle use would continue to disturb the wild horse herd in the WSAs. Juniper rip-rap would cause short term impacts to the scenic quality of the South Fork Crooked River Canyon but would be offset by long-term gains in riparian condition.

Conclusion: In the absence of wilderness designation, projected management activities would directly and indirectly impair wilderness values on a long-term basis on approximately 4,000 acres (14 percent of combined acreage of the WSAs) with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire South Fork WSA (19,631 acres) and Sand Hollow WSA (8,791), totaling 28,422 acres, would be open to mineral entry.

Energy Development

Oil and gas exploration and development would be allowed within the WSAs. Development of seven oil and gas wells is projected.

Conclusion: Production from seven projected oil and gas wells would occur.

Mineral Development

Mineral entry would be allowed within the WSAs. Exploration for bentonite and zeolites, and development of three suspected deposits of semi-precious stones are projected.

Conclusion: Production of semi-precious gemstones from three projected open pit mines would occur.

Impacts on Vegetation

Vegetation would be substantially altered by burning and juniper cutting on 13,770 acres. These treated areas would rapidly change from mid-seral stage to late seral stage. The untreated late seral stage low sagebrush communities would slightly change toward early seral stage in the long term. An aspen stand would be rejuvenated. Riparian vegetation along the South Fork of the Crooked River and Sulphur Creek would improve as a result of spring and rest grazing and vegetation manipulation. Utilization of key forage species would increase from 35 percent to 50 percent in most areas as a result of allocating 997 AUMs currently available but not presently allocated, and from allocation of 500 AUMs made available through construction of seven reservoirs. There would be a corresponding decrease in residual ground cover.

The 13.4 miles of ways and 2.1 miles of interior dead-end roads would not revegetate due to continued vehicle use.

In the South Fork WSA, vegetation change would occur as a result of reservoir construction (12 acres), guzzler installation (1 acre), energy development (14 acres) and mineral development (4.5 acres). These disturbances would generally eliminate vegetation from the immediate area. In the Sand Hollow WSA, vegetation change would result from reservoir construction (2 acres), guzzler installation (less than 1 acre) and energy development (18 acres).

Conclusion: There would be an increase in utilization with a corresponding decrease in residual ground cover over most of the area resulting in a more grazed appearance. Riparian vegetation would be improved along the South Fork of the Crooked River an Sulphur Creek. A total of 13,770 acres would change from mid-seral stage to late seral stage as a result of vegetation treatment. For these acres, ground cover would increase. Wildlife, energy/mineral developments and other livestock projects would impact 55 acres.

Impacts on Wildlife

Habitat management actions (11,580 acres of juniper/sagebrush control) would be undertaken to increase diversity, which would improve habitat quality for deer, antelope and elk. Disturbance to wildlife from vehicle use of the area would continue. Mineral exploration and development would disturb wildlife in the immediate vicinity of work. Grazing allocation increases would leave sufficient forage to meet ODFW goals for big game. Big game populations would increase as forage increases. The decrease in residual cover would have negative impacts on species using that vegetation for nesting and escape cover, but would be offset by an increase in ground cover resulting from vegetation treatments.

Conclusion: Wildlife habitat diversity would be increased. Negative impacts to wildlife from increased vehicle use of area, decreased residual cover and increased mining activity would be anticipated. Overall, wildlife populations would benefit due to the ability to create habitat diversity, but the continued disturbance from vehicles and other activities would partially offset these benefits.

Impacts on Watershed

Improved watershed stability would occur along the South Fork of the Crooked River and Sulfur Creek where juniper rip-rap (4.5 miles), juniper clearing (2,190 acres) and early spring and rest grazing treatments for riparian enhancement would occur. There would be a reduction in streambank trampling and more streambank vegetation, which in turn would result in greater streambank stabilization, less sedimentation and increased water flow. Water temperatures would be slightly lower due to shading from streambank vegetation. Fecal coliform bacteria from cattle would be greatly reduced resulting in improved water quality.

Upland watershed conditions would improve in areas where juniper/sagebrush control (11,580 acres) and the juniper clearing (2,190 acres) would be conducted. A loss of protective ground cover from increased grazing would be offset by an increase in ground cover from the vegetation treatments.

Conclusion: Water quality and quantity and streambank stability would improve on 7 miles of the South Fork of the Crooked River and 2 miles of Sulphur Creek. Upland watershed conditions would improve where vegetative manipulations would occur.

Impacts on Livestock Grazing

Presently available but unallocated forage would be allocated resulting in an increase in livestock forage allocation of 997 AUMs within affected pastures. An additional 500 AUMs would be allocated due to increased forage enhancement and availability from the construction of seven reservoirs. Vehicle use for livestock management and facility inspection/maintenance would continue on 13.4 miles of ways and 2.1 miles of road. Improved livestock management and distribution would result from the construction of seven new reservoirs.

Conclusion: An additional allocation of 1,497 AUMs would be realized.

Impacts on Recreation Use

Motorized recreation use would continue on 13.4 miles of ways and 2.1 miles of dead-end interior road. Continued vehicle access to hunting areas, fishing trails from the canyon rim of the South Fork Crooked River and rockhounding areas would maintain the current levels of recreation use. Surface disturbance and disruption of wildlife from energy and mineral exploration and development and range/wildlife developments would slightly disturb the natural setting for recreational activities, especially hunting, camping and primitive recreation activities such as hiking and wildlife observation. However, use levels for these activities would not change.

Conclusion: The area's recreation use level of 4,500 visitor days per year, which is increasing at an annual rate of two to five percent, would not be affected.

Impacts on Local Personal Income

Livestock grazing would increase by 1,497 AUMs. Projected energy and mineral development would amount to seven oil and gas production wells and three non-metallic mines. Overall recreation use would remain at 4,500 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $18,000 per year, plus an unknown level of increase attributable to the projected energy and mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $18,000.

Unavoidable Impacts of the Proposed Action

Under the Proposed Action (Enhanced Wilderness) for the 25,792 acres recommended suitable for wilderness, surface-disturbing exploration and development for energy and minerals, as well as an increase in livestock forage allocation, would be foregone. Vehicle use would be excluded, reducing opportunities for those who prefer this type of recreation. There would be a slight increase in livestock management costs as a result of the closure of 7 miles of roads and 10.5 miles of ways. Projects necessary to reverse a change in ecological status would not be implemented to the degree necessary and ecological status would continue to move toward early seral status.

For the 3,020 acres recommended as nonsuitable, vegetation treatment would disturb 1,390 acres. In the long term, wilderness values would be impacted on 1,500 acres.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action for the 25,792 acres recommended suitable for wilderness, most existing short-term uses would continue, with some additional, minor inconvenience and expense to livestock operators resulting from the exclusion of vehicles for day-to-day inspection and maintenance activities. Vehicle-oriented recreation would decline. The long-term productivity of the wilderness values would be preserved.

For the 3,030 acres recommended as nonsuitable, short-term impacts to the vegetation through juniper control on 1,390 acres and juniper rip-rap on Sulphur Creek would reduce wilderness values on approximately 1,500 acres with further declines from other potential uses over the long term. Overall productivity would increase in the long term.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action there would be no irreversible and irretrievable commitments of wilderness resources or any other resources in the 25,792 acres recommended as suitable. In the 3,030 acres recommended as nonsuitable, oil and gas reserves produced from one oil and gas well and semi-precious stones produced from two small mines would be irreversibly and irretrievably committed. As a result, wilderness values on approximately 1,500 acres would be reduced.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

Both areas are capable of being managed to preserve their wilderness characteristics. Manageability would be enhanced if private inholdings in the South Fork WSA and the 940 acres of mineral estate in both WSAs were acquired. Currently, private inholdings do not affect the area's manageability. Three separate private inholdings in the South Fork WSA, totaling 440 acres, are used for livestock grazing. Landowners have not expressed interest in changing the use of the land, and it does not appear likely that land use will change in the foreseeable future; however, this could change at the discretion of the owners. The acquisition of these parcels would prevent potential adverse effects from incompatible surface disturbing activities.

There are 20 active mining claims located in the northern portion of the South Fork WSA. The extraction of semi-precious stones, primarily limb casts, has caused some surface disturbance. No structures or other developments are present. A minimal amount of mining activity has occurred. These claims create a manageability problem in that up to 20 acres could be disturbed in the long term with associated disturbance to wilderness values caused by vehicle traffic and mining activity. Solitude and naturalness would especially be affected. Three mining claims, all inactive, exist in two portions of the Sand Hollow WSA.

It could be difficult to manage a 400-acre area along the west boundary of the Sand Hollow WSA to preserve its wilderness values. Most of the area is seeded to crested wheatgrass and is in an unnatural condition.

Manageability would also be enhanced by the closure of 6.4 miles of boundary road which separate the two WSAs and the 2.1 miles of interior road in the WSAs.

Rationale for Selection of the Proposed Action

The enhanced wilderness alternative is the proposed action because the benefits of preserving the wilderness values of the two areas outweigh the ineral development and other nonconforming uses that would be precluded by wilderness designation.

Both the South Fork and Sand Hollow WSAs are generally free of human developments and appear to have been affected primarily by the forces of nature. With the exception of the northern portion of the South Fork WSA, totaling 2,630 acres, and 400 acres along the western boundary of the Sand Hollow WSA, there would be few problems in managing the areas to preserve their wilderness values. The existing ways and old vegetation treatments within the combined area recommended as suitable for wilderness are substantially unnoticeable because they are reverting to a natural condition. Excellent topographic and vegetative screening also shield them from view. Opportunities for solitude and primitive types of recreation are outstanding in several locations within these WSAs.

These values would be significantly enhanced by combining the WSAs and closing approximately 6.4 miles of boundary road between them. The resulting area would provide a unique wilderness opportunity encompassing a variety of landscapes that include a dry, wind-swept plateau, rolling, juniper-covered hills and a rugged basalt canyon accented by the South Fork of the Crooked River.

Closing the road between the two WSAs and designating a larger wilderness area would enhance the naturalness of the area and increase opportunities for solitude and primitive recreation.

For the 2,630-acre northern portion of the South Fork WSA, the energy and mineral potential combined with the manageability problems associated with the projected development of 20 existing mining claims resulted in the exclusion of this area from the suitable recommendation.

The 400-acre area containing a crested wheatgrass seeding along the west boundary of the Sand Hollow WSA is recommended as nonsuitable. Naturalness is limited in this area and wilderness values are impaired by the sights and sounds of traffic on the road which forms the boundary of the WSA.

6. Summary and Analysis of Public Comments

The following is a summary of public comments and responses to those comments specific to this WSA. They deal with the adequacy of the analysis in this appendix. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

Comment: The two WSAs (Sand Hollow and South Fork) should be combined. **Response:** See discussion in Chapter 2, Description of the Alternatives, regarding the Enhanced Wilderness alternative and discussion of a similar alternative which was considered but not analyzed in this appendix.

Comment: T & E plant *Rorippa columbiae* may be present and was not addressed along with nine other Oregon Natural Heritage Data Base (ONHDB) plants. **Response:** The WSAs may be within the range of *Rorippa columbiae.* However, present evidence suggests that its preferred habitat is either washed gravel along river courses (as along the Columbia River) or in alkaline vernal pools. Neither exists in the WSAs and therefore this plant is not suspected. Existing information and plant inventory in areas adjacent to the WSAs do not support the inclusion of any other ONHDB plants on a list of suspected plants in the WSAs.

Comment: A lack of juniper control will hurt livestock operations. **Response:** Projects (which would result in an increase in livestock use) would not be initiated in the area recommended suitable for wilderness. Livestock use would remain at existing levels.

Table 1. Summary of Proposed Management Under Each Alternative, South Fork (OR-5-33) and Sand Hollow (OR-5-34) WSAs.

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	28,422	25,392	0
Acres Closed to ORVs by Wilderness Designation[1]	28,422	25,392	0
Miles of Roads Closed	0	7	0
Miles of Ways Closed	13.4	10.5	0
Acres of Full Fee Estate Acquired[2]	0	400	0
Acres of Mineral Estate Acquired[3]	0	880	0
Energy/Mineral Actions			
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	27,482	24,512	0
Roads Constructed (miles)	0	1	5
Oil and Gas Pipelines (miles)	0	1	5
Drill Sites (number)	0	1	7
Mine Sites (number)	0	2	3
Structural Wildlife Projects Developed			
Guzzlers (number)	0	0	3
Nonstructural Wildlife Projects Developed Brush control w/o seeding (including juniper control)	1,080	1,080	11,580
Structural Livestock Projects Developed			
Fence (miles)	0	2.5	2.5
Reservoirs (number)	0	0	7
Unallocated Existing Forage Allocated (AUMs)	0	24	997
Increased Forage Allocation Projects (AUMs)	0	0	500
Watershed Projects Developed Rip-Rap (miles)	0	1.5	4.5
Juniper Control (acres)	0	1,390	2,190

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[1] Except for 2.1 miles of dead-end interior roads, 6.4 miles of road between the WSAs and 13.4 miles of ways in the WSAs, most of the acreage shown is already closed to cross-country vehicle use through an existing "limited" ORV designation.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] Upon acquisition of the mineral estate, these lands would be withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives.

Resource or Activity	All Wilderness	Enhanced Wilderness (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 19,631 acres of the South Fork WSA and 8,791 acres of the Sand Hollow WSA would protect and enhance existing wilderness values.	Wilderness designation of 17,401 acres of the South Fork WSA (assuming acquisition of private inholdings) and 8,391 acres of the Sand Hollow WSA, along with the acquisition of 880 of mineral estate and closure of seven miles of boundary and interior roads would protect and enhance existing wilderness values on 25,792 acres. Wilderness values on 3,030 acres recommended nonsuitable would be impaired as a result of projected management actions.	Projected management actions would impair the area's wilderness values on approximately 4,000 acres with further delines from other potential uses over the long term.
Energy and Mineral Development	Projected production from seven oil and gas wells and three small deposits of semi-precious stones stones would be foregone.	Projected production from six oil and gas wells and one small deposit of semi-precious stones would be foregone. Projected production from one oil and gas well and two semi-precious gemstone mines would occur.	Projected production from seven oil and gas wells and three projected semi-precious gemstone mines would occur.
Vegetation	In the short term vegetation preserved in present state except for 1,080 acres where ecological succession would be accelerated. In the long term 17,000 acres of untreated vegetation would move toward early seral status. Riparian vegetation along the South Fork Crooked River would continue to improve. 13.4 miles of ways would revegetate.	In the short term vegetation preserved in present state except for 2,470 acres where ecological succession would be accelerated. In the long term 16,000 acres of untreated vegetation would move toward early seral stage. Riparian vegetation along the South Fork Crooked River and Sulphur Creek would improve. Seven miles of roads and 10.5 miles of ways would revegetate. Thirty acres would be disturbed by energy and mineral development.	In the short term vegetation preserved in present state except for 13,770 acres where ecological succession would be accelerated. In the long term 3,000 acres of untreated vegetation would move toward early seral stage. Riparian vegetation along the South Fork Crooked River and Sulphur Creek would improve. Utilization of livestock forage would increase and residual cover would decrease in untreated areas. Other livestock, wildlife, mineral and energy developments would disturb 55 acres.
Wildlife	Habitat and populations would be maintained through prescribed burning and closure of 13.4 miles of ways. Habitat quality would be reduced in the long term.	Habitat and populations would be maintained and enhanced through prescribed burning, and closure of 7 miles of roads and 10.5 miles of ways.	Habitat and populations would be maintained with an increase in habitat diversity and some disturbance to populations from energy and mineral activities. Big game populations would increase.

Table 2. Summary of Environmental Consequences of Alternatives. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness (Proposed Action)	No Wilderness/No Action
Watershed	Water quality and quantity and streambank stabilization would continue to improve along the South Fork Crooked River. Upland watershed conditions would improve on 1,080 acres. Watershed conditions would be less stable in the long term on 17,000 acres.	Water quality and quantity and streambank stabilization would improve in the South Fork Crooked River and in Sulphur Creek. Upland watershed stability would improve on 2,470 acres. Watershed conditions would be less stable in the long term on 16,000 acres.	Improved water quality, quantity, and watershed stability along the South Fork Crooked River and Sulphur Creek. Upland watershed stability would improve on 13,770 acres and in the long term would be less stable on 3,000 acres.
Livestock Grazing	1,497 AUMs of currently available but unallocated forage and forage potentially available through reservoir construction would be foregone. Vehicle use of 13.4 miles of ways would be precluded with some inconvenience and a slight increase in cost to the livestock operators.	1,473 AUMs of currently available but unallocated forage and forage potentially available through reservoir construction would be foregone.24 AUMs would be allocated in the nonsuitable portion of Sand Hollow WSA. Vehicle use of 10.5 miles of ways and 7 miles of roads would be precluded resulting in some inconvenience and additional expense to livestock operators.	An additional 1,497 AUMs of currently available but unallocated forage and forage made available through reservoir construction would be allocated.
Recreation Use	The recreation use level would suffer a slight decrease of 150 visitor use days per year. There would be a change to primitive, nonmotorized types of recreation use.	There would be a net decrease of 500 visitor days per year in the recreation use level, and a change to primitive, nonmotorized types of recreation use.	The recreation use level would not change.
Local Personal Income	Annual local personal income would decrease by approximately $1,800.	Annual local personal income would decrease by approximately $6,000.	Annual local personal income would increase by approximately $18,000.

Table 3. Classification of Energy and Mineral Potential, South Fork (OR-5-33) and Sand Hollow (OR-5-34) WSAs.

Commodity	Area	Level of Potential	Level of Certainty
Metals	All of both WSAs	L	B
Diatomite	All of both WSAs	L	C
Limestone	All of both WSAs	L	C
Zeolites	Part of Sand Hollow*	M	C
	Rest of area	L	C
Bentonite	Part of Sand Hollow*	H	C
	Rest of area	L	C
Semi-precious	Part of South Fork*	H	D
	Rest of area	L	B
Uranium/Thorium	All of both WSAs	L	B
Geothermal	All of both WSAs	O	C
Oil/Gas	All of both WSAs	H	C
Sodium/Potassium	All of both WSAs	L	B
Coal	All of both WSAs	O	B
Tar Sands/Oil Shale	All of both WSAs	O	B
Sand and Gravel	All of both WSAs	L	C
Crushable Rock	All of both WSAs	L	C

*See Map 5

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

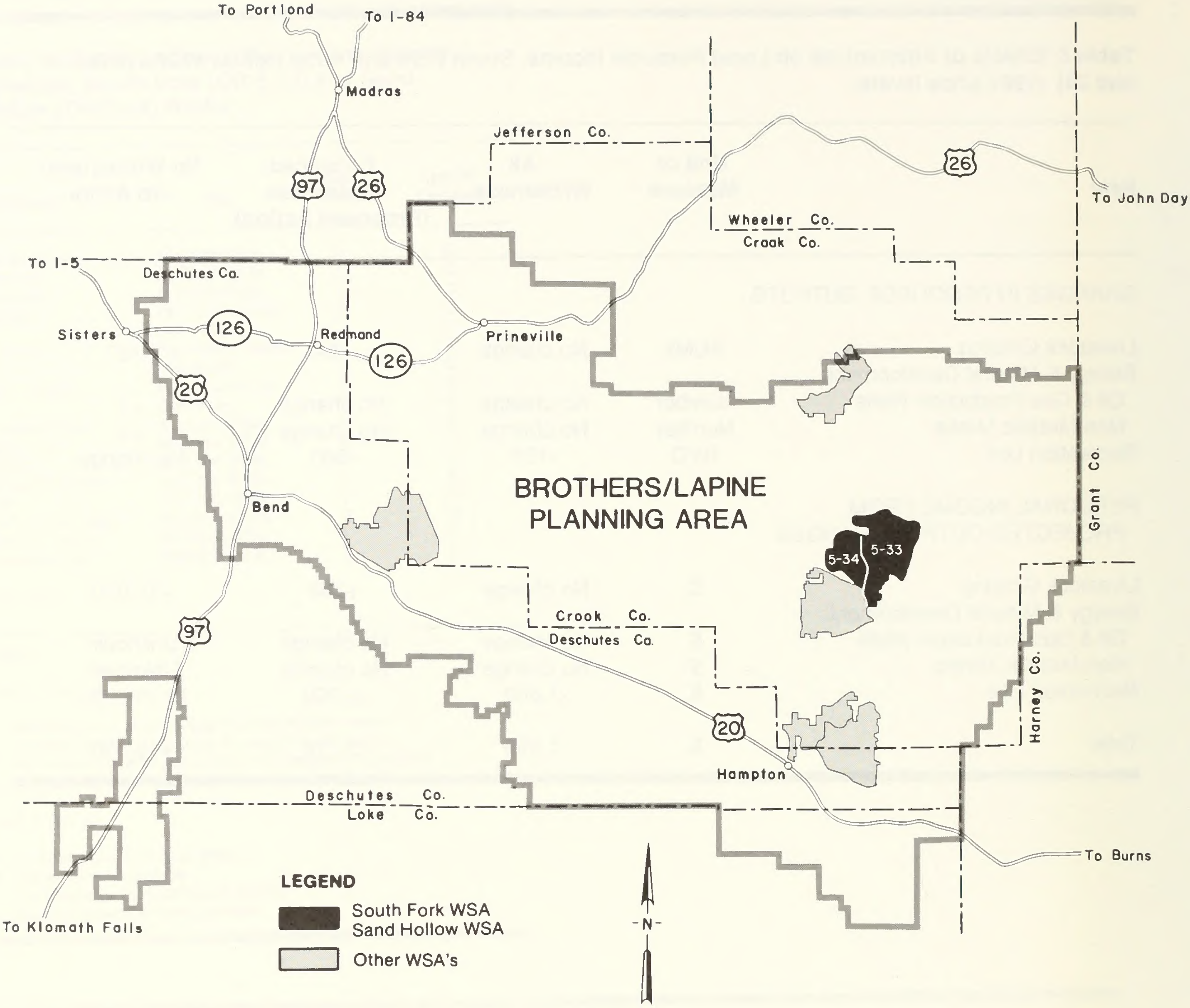
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

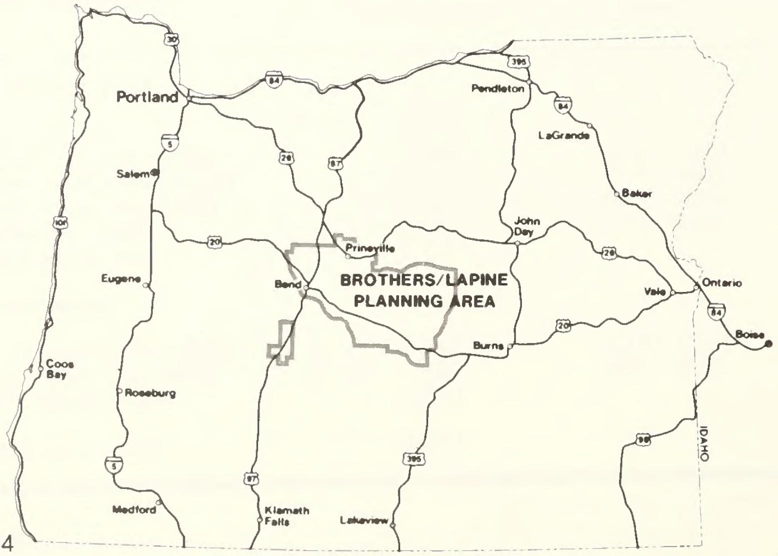
Table 4. Existing Livestock Use, South Fork (OR-5-33) and Sand Hollow (OR-5-34) WSAs.

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allotment in WSA	Current Estimated Use in WSA (AUMs)
South Fork WSA				
Camp Creek Community (No. 0064)	966	4/16 - 10/31	42	405
Cold Springs (No. 0009)	2,253	4/16 - 10/31	2	35
Dagis Lake (No. 0056)	487	5/01 - 9/30	53	265
Lister (No. 0047)	2,011	4/01 - 10/31	25	531
Total South Fork	5,717			1,236
Sand Hollow				
Cold Springs (No. 0009)	2,253	4/16 - 10/31	11	252
Dagis Lake (No. 0056)	487	5/01 - 9/30	33	160
Total Sand Hollow	2,740			412
Total Both WSAs	8,457			1,648

Table 5. Effects of Alternatives on Local Personal Income, South Fork and Sand Hollow WSAs (OR-5-33 and 34) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness (Proposed Action)	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	+24	1,497
Energy & Mineral Development:				
Oil & Gas Production Wells	Number	No change	No change	+7
Non-Metallic Mines	Number	No change	No change	+3
Recreation Use	RVD	-150	-500	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	No change	+288	+18,000
Energy & Mineral Development:				
Oil & Gas Production Wells	$	No change	No change	Unknown
Non-Metallic Mines	$	No change	No change	Unknown
Recreation Use	$	-1,800	-6,000	No change
Total	$	-1,800	-5,712	+18,000





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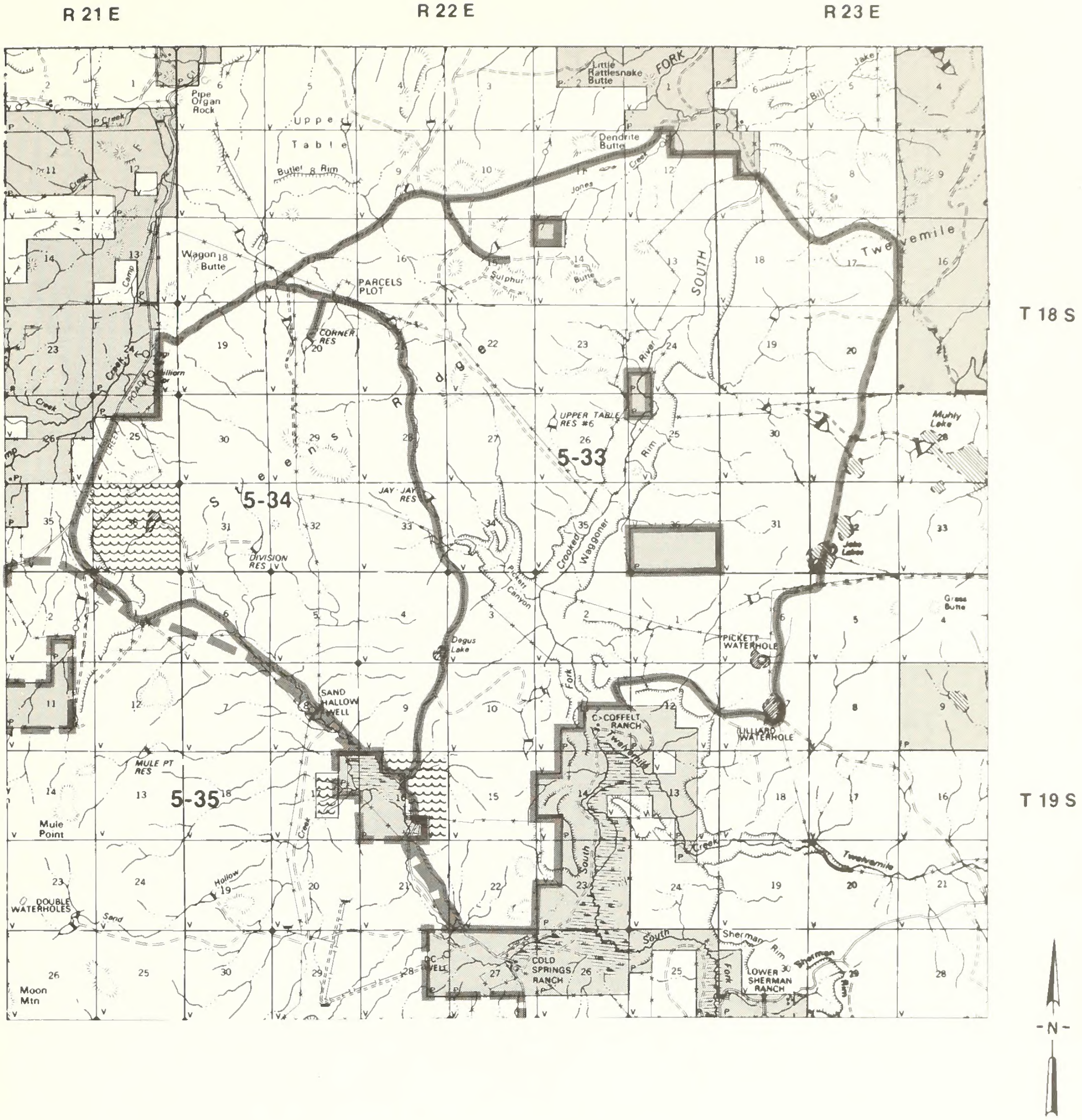
Prineville District
South Fork WSA
OR-5-33 and
Sand Hollow WSA
OR-5-34

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▣ BLM Land in WSA Studied Under Section 603 of FLPMA
- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness
- ☐ Bureau of Land Management
- ▩ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)

U. S. Department of the Interior
Bureau of Land Management

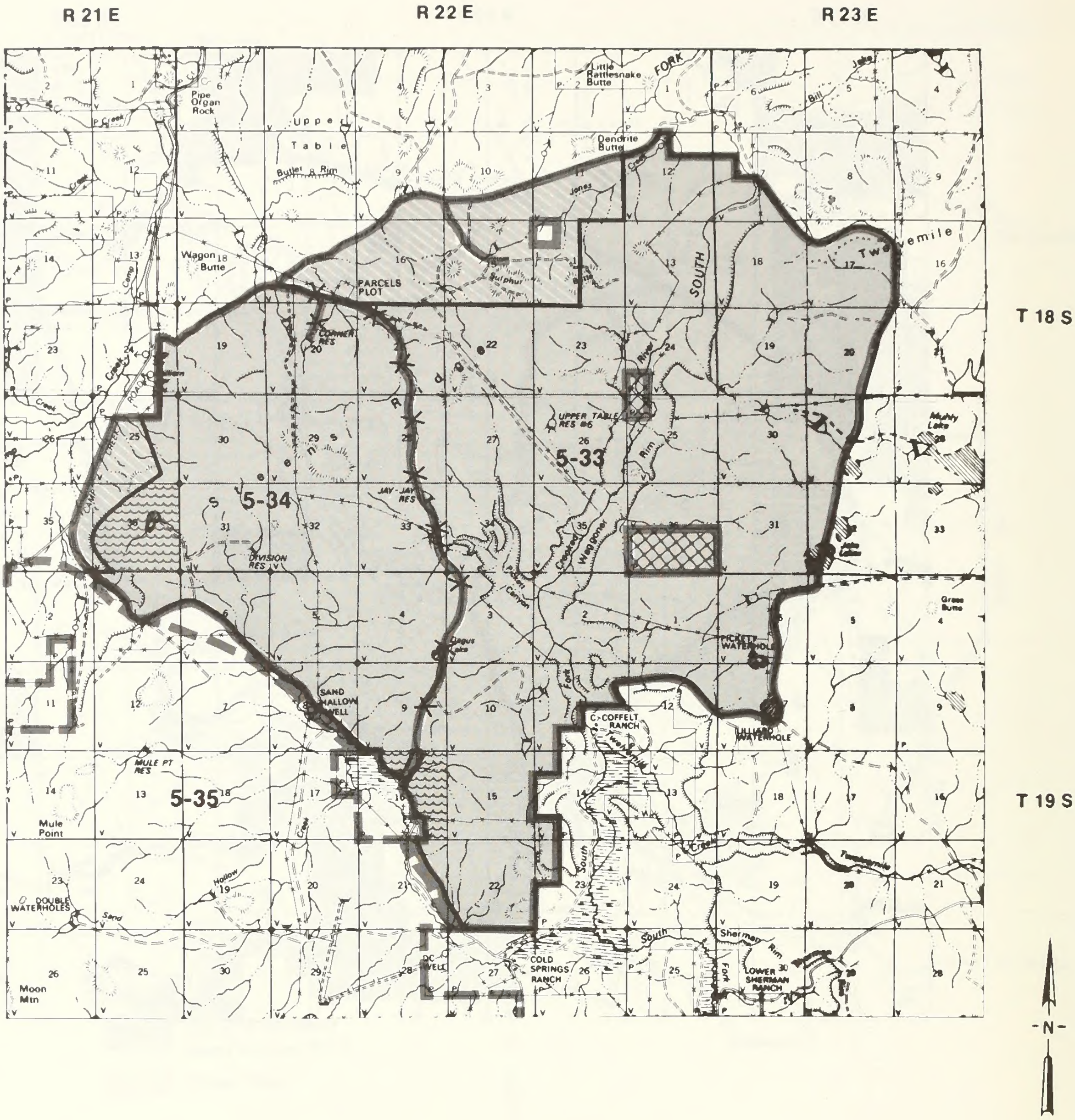
Prineville District

South Fork WSA
OR-5-33 and
Sand Hollow WSA
OR-5-34

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

≋ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

-X-X- Recommended Road Closure

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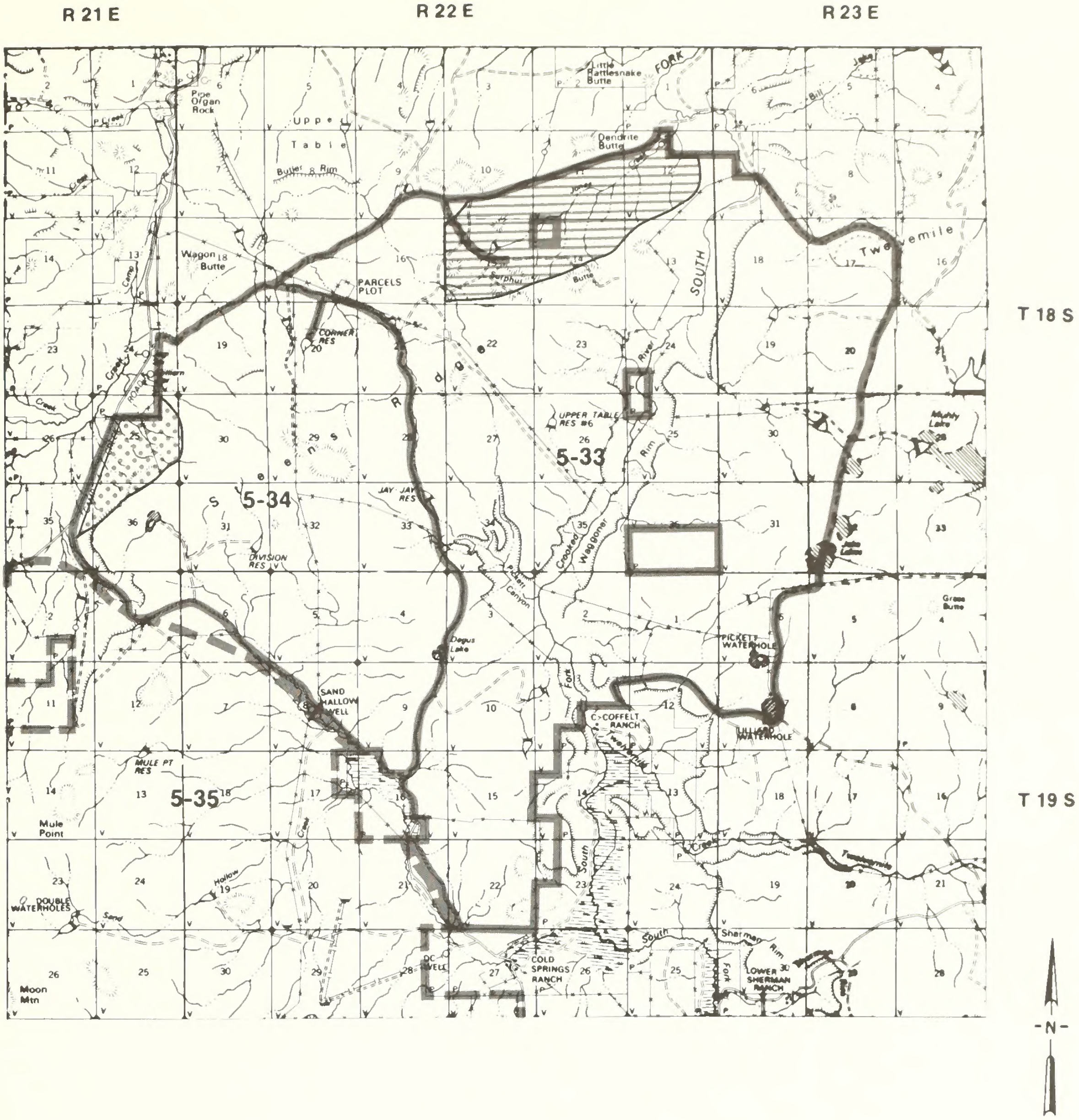
South Fork WSA
OR-5-33 and
Sand Hollow WSA
OR-5-34

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



▤ **High Potential (HD) for Semiprecious Stones**

░ **High Potential (HD) for Bentonite**
Moderate Potential (MC) for Zeolites

Entire WSA:
High Potential
(HC) for Oil and Gas

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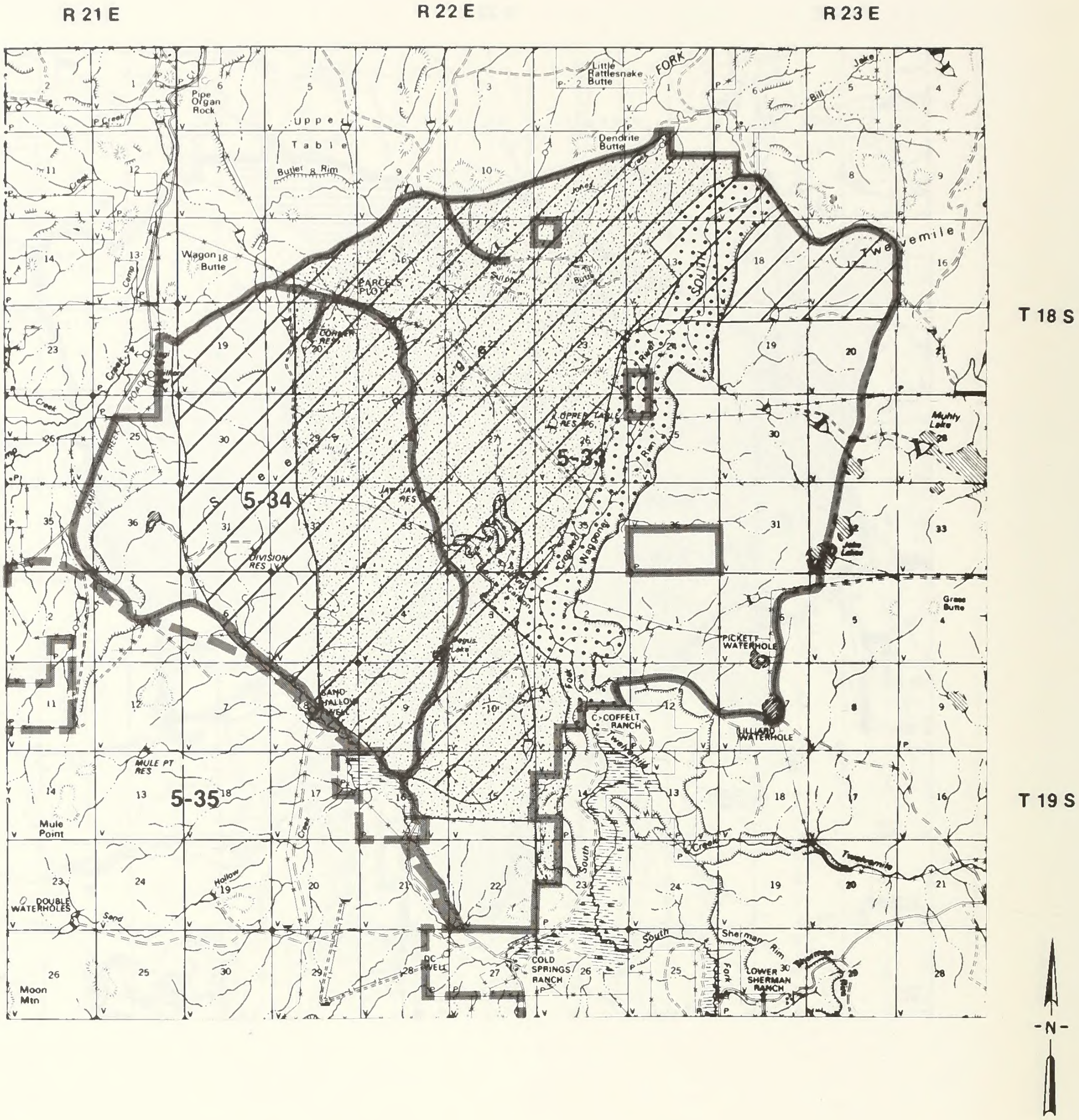
South Fork WSA
OR-5-33 and
Sand Hollow WSA
OR-5-34

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



LEGEND

▨ Crucial Mule Deer Winter Range

░ Wild Horse Herd Management Area

⁘ Outstanding Scenic Values

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South Fork WSA
OR-5-33 and
Sand Hollow WSA
OR-5-34

SPECIAL FEATURES

1 0 1 2 MILES

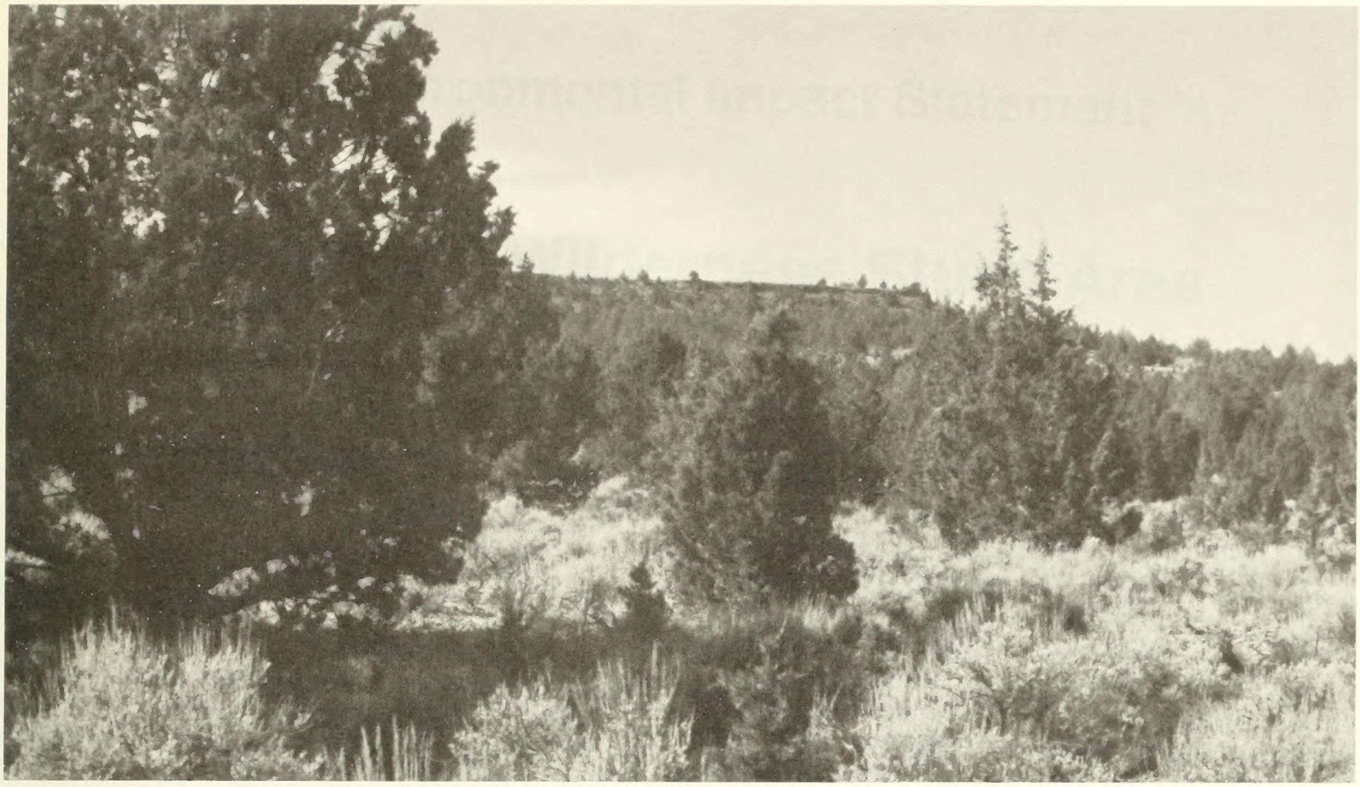
MAP 5

South Fork WSA, OR-5-33. Looking east toward rockhounding areas in the northern portion of the WSA (the background is not within the WSA). The foreground is within area recommended nonsuitable under the enhanced (proposed action) alternative. Illustrates rockhounding areas where mining claims are located. June 1979.

South Fork WSA, OR-5-33. Looking northwest across the northern portion of the South Fork of the Crooked River Canyon. Within the area recommended suitable under the enhanced (proposed action) alternative. Illustrates typical canyon scenery. June 1979.

South Fork WSA, OR-5-33. Looking north in the mid-portion of the South Fork of the Crooked River Canyon. Within the area recommended suitable under the enhanced (proposed action) alternative. Illustrates the scenic qualities of the canyon. June 1979.

Sand Hollow WSA, OR-5-34. Looking north into the central portion of the WSA. Within area recommended suitable under the enhanced (proposed action) alternative. Illustrates the size of the Steens Ridge. September 1979.



Sand Hollow WSA, OR-5-34. Looking west toward the northern portion of the WSA. Within the area recommended suitable under the enhanced (proposed action) alternative. Typical example of basalt rim and dense juniper tree clusters within the WSA. September 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Gerry Mountain Wilderness Study Area (OR-5-35)

1. Introduction

General Description of Study Area

The Gerry Mountain Wilderness Study Area (WSA) is located in Crook County, approximately 70 miles southeast of Bend and 12 miles north of Hampton, Oregon, and U.S. Highway 20. It is about 200 miles southeast of Portland, Oregon (see Map 1).

Gerry Mountain WSA is somewhat square in shape, tapering to the east, and contains Gerry and Moon Mountains and Mule Point (see Map 2). The WSA is approximately 7 miles long, north to south, and 7 miles wide, east to west. There are 20,700 acres of public land within the WSA. This includes 720 acres of split-estate land. Rights to energy and minerals on these split-estate lands are not owned by the federal government. Private and public lands surround the WSA.

Much of the WSA is covered with juniper. Big sagebrush, rabbitbrush and bunchgrass form the understory. There are no naturally-occurring perennial water sources within the WSA, although there are 11 functional reservoirs. The main feature of the WSA is Gerry Mountain, which rises 1,100 feet above the surrounding countryside. Low, rolling hills and small, shallow basins surround Gerry Mountain, Moon Mountain and Mule Point.

The southern and eastern boundaries are a combination of private property and county-maintained high standard gravel roads. The northern boundary is a combination of rimrock and private property. The western boundary is a combination of privately-maintained low standard dirt road and private property.

Interrelationships

Another WSA, Sand Hollow (OR-5-34), is adjacent to Gerry Mountain WSA on the northeast. The two study areas are separated by a well-maintained graveled county road. The WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) Maury Wildlife Unit. The WSA supports approximately 230 mule deer in spring and winter, and 75 in summer and fall. Antelope and elk, on a yearlong basis, number approximately 20 and 10 respectively. ODFW big game management goals for this unit are to maintain antelope, elk and mule deer populations at present levels. ODFW and BLM management goals are to restore populations of sage grouse, ferruginous hawks and Swainson's hawks so that they can be removed from the Federal candidate list to a non-listed status. The overall goal for nongame wildlife is to maintain populations of naturally occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species for this area.

Crook County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review processes. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on the area's wilderness values,
- impact on grazing use levels and management
- impact on energy and mineral development
- impact on watershed management

- impact on antelope, mule deer, elk and nongame wildlife populations, and
- impact on recreation use levels

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonable foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness
- partial wilderness
- no wilderness/no action (proposed action)

An enhanced wilderness alternative is not analyzed because there is no feasible opportunity to significantly enhance wilderness values by acquiring private inholdings, closing interior roads or acquiring adjacent private land. An alternative which would combine Gerry Mountain WSA with the adjacent Sand Hollow WSA (OR-5-34) is not analyzed because closing the road separating the two WSAs is not feasible; the road is maintained by the county and provides essential access for local traffic.

Public comments raised another alternative which would add approximately 5,000 acres to the south of Gerry Mountain WSA. This alternative was considered but dropped from further consideration because it would require the closing of a well-maintained county road which provides important local access.

All Wilderness

Under this alternative, 20,700 acres of public land would be recommended suitable as wilderness (see Map 2). The boundary on the east and south would be defined by high standard gravel roads and private land; on the north and west it would be defined by private land, rimrock, and a low standard dirt road. For purposes of analysis, this alternative assumes the mineral estate of the split-estate land would not be acquired; however, 14.7 miles of ways would be closed.

Energy and Mineral Development Actions

Wilderness designation would close 19,980 acres within the WSA to energy and mineral entry. A total of 720 acres of split-estate land would be open to mineral exploration and development. Surface-disturbing exploration and development of oil and gas, bentonite and zeolites would be precluded on 19,980 acres. If determined to be economic, one existing bentonite claim would be projected to be developed which, including facilities and 0.5 mile of access road, would disturb eight acres. The 720 acres of split-estate land within the WSA have a high potential for oil and gas, and exploration would be expected. However, in the absence of known oil and gas deposits, development is not anticipated on these isolated parcels. The 720 acres of split-estate land have low potential for bentonite and zeolite deposits, and mineral exploration and development are not anticipated.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW wildlife management goals and consistent with guidelines established in BLM's Wilderness Management Policy. The primary manner in which habitat would be managed is through close coordination with the livestock grazing management plan to ensure adequate wildlife cover and forage, and through fire management to restore the natural vegetative processes. Proposed projects include the attempted burning of up to 8,000 acres of juniper and development of two water guzzlers. For purposes of analysis, the burning would be allowed since it would maintain a fire-dependent ecosystem and the guzzlers would be allowed since they replace two reservoirs which would no longer be maintained.

While 8,000 acres would be attempted to be burned, it is unlikely that more than 1,000 acres would actually burn due to limited understory necessary to carry fire and restrictions on burning during extreme fire conditions. Any acreage burned by wildfire would replace, on an acre-by-acre basis, that acreage proposed for prescribed burning.

Livestock Management Actions

Livestock use would remain at the current use level of approximately 1,565 AUMs within the portions of two allotments in the WSA. The season of use would remain as identified in Table 4 for the two allotments. For purposes of analysis, 1.75 miles of riparian fence would be allowed to be constructed resulting in implementation of an early spring/rest riparian grazing treatment for 1.3 miles of Clover Creek. Vehicle use for day-to-day livestock management would be precluded on 14.7 miles of ways. Management of livestock and maintenance of 17 miles of fences would be conducted mainly on horseback. Mechanized heavy equipment would be used, subject to permit, on the average of once every 10 to 15 years to maintain existing facilities, including 11 reservoirs, a storage tank, water troughs and 3.2 miles of pipeline.

Recreation Management Actions

The entire 20,700 acres would be closed to motorized vehicle use. At present, vehicle use is limited through ORV designation to the 14.7 miles of existing ways. Recreation use levels are estimated to be 150 visitor days per year. Most of the current use in the area is by vehicles used for sightseeing or for hunting access.

Partial Wilderness

Under the partial wilderness alternative, 16,470 acres of public land would be recommended suitable as wilderness (see Map 3). A 1,490-acre area on the north edge of the WSA and a 2,740-acre area on the eastern boundary, totaling 4,230 acres, would be recommended nonsuitable. The northern boundary would be defined by rimrock and the eastern boundary would be defined by a livestock fence. The southern and western boundaries would be defined by a high standard and low standard dirt road, respectively, and by private land. For purposes of analysis, this alternative assumes the mineral estate of the split-estate land would not be acquired; however, 6.7 miles of ways would be closed.

Energy and Mineral Development Actions

Wilderness designation would close 15,830 acres to all forms of energy and mineral entry. Surface-disturbing exploration for oil and gas, bentonite and zeolites would be prohibited. A total of 640 acres of split-estate land in the suitable portion and the 4,230 acres recommended nonsuitable would be open to surface-disturbing mineral exploration and development. Projected exploration and development on the 4,230 acres recommended as nonsuitable would be expected to involve seismic surveys, possible drilling of one well and construction of approximately 1 mile of access road and pipeline. Total surface disturbance would be five acres. The 640 acres of split-estate land in the WSA have a high potential for oil and gas, and exploration would be expected. However, in the absence of known oil and gas deposits, development is not anticipated on this isolated parcel.

Approximately 700 acres of a 1,460-acre area with high potential for bentonite and moderate potential for zeolites would be open to mineral entry. Projected exploration would involve surface examination, trenching and sampling. If an economic deposit were discovered, it is projected that one open-pit mine plus facilities and 0.5 mile of access road would disturb 15 acres. The 640 acres of split-estate land in the suitable portions of the WSA would be open to mineral entry. However, the tract has low potential for minerals and no development is expected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with guidelines established in the BLM's Wilderness Management Policy. The primary manner in which habitat would be managed in the area recommended suitable for wilderness would be through close coordination with the livestock grazing management plan to ensure adequate wildlife cover and forage, and through fire management to restore the natural vegetative processes. In the area recommended suitable for wilderness, proposed projects include the attempted burning of 7,400 acres of juniper, recognizing that approximately 900 acres would actually burn, and development of two wildlife guzzlers. In the area recommended nonsuitable for wilderness, proposed projects include juniper control on 600 acres and forb interseeding of an existing

2,740-acre crested wheatgrass seeding. Any acreage burned by wildfire would replace, on an acre-by-acre basis, that acreage proposed for prescribed burning.

Livestock Management Actions

Livestock use would remain at the current level of approximately 995 AUMs within the area recommended suitable for wilderness designation, encompassing portions of two allotments. The season of use would remain as identified in Table 4. Riparian fence totaling 1.75 miles would be constructed resulting in an early spring/rest riparian grazing treatment for 1.3 miles of stream. Vehicle use for day-to-day livestock management on 6.7 miles of ways would be precluded. Management of livestock and maintenance of 11.5 miles of fences would mainly be conducted on horseback. Mechanized heavy equipment would be used, subject to permit, on the average of once every 10 to 15 years to maintain 10 reservoirs.

For the area recommended nonsuitable, livestock use would be increased by 96 AUMs, as a result of the allocation of currently available but unallocated, forage. Management would be changed from rest rotation to deferred rotation. These changes would only occur on the eastern land which is fenced from the rest of the WSA. Vehicle use would be allowed on 8 miles of ways in this area which would allow for maintenance of 5.5 miles of fence, 3.2 miles of pipeline, one reservoir, a storage tank and troughs.

Recreation Management Actions

For the area recommended suitable for wilderness designation, a total of 16,470 acres and 6.7 miles of ways would be closed to motorized vehicle use. At present, vehicle use is limited through ORV designation to these 6.7 miles of ways as well as to the remaining 8 miles of ways in the area recommended as nonsuitable. Current recreational use is estimated to be 150 visitor days per year. Most of the current vehicle use occurs for hunting and sightseeing activities. For the 4,230 areas recommended as nonsuitable, vehicle use would continue on 8 miles of ways.

No Wilderness/No Action (Proposed Action)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

The entire 20,700-acre WSA would be open to energy and mineral entry.

Due to the high potential for oil and gas in the WSA, initial exploration by seismic surveys would be expected to occur. Surface disturbance from the surveys would be negligible. Further exploration is projected to involve drilling two test exploration wells which would require construction of drill pads, mud pits and 2 miles of access roads. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. Five additional wells would be anticipated which would require 3 miles of access roads. Approximately 5 miles of pipeline would be constructed to market the gas. Surface disturbance is projected to total 20 acres.

Approximately 1,460 acres in the northwestern and western parts of the WSA are determined to have high potential for bentonite deposits and moderate potential for zeolite deposits. Exploration and development would likely consist of surface examination, trenching and sampling. If these deposits were economic, it is anticipated that one open-pit mine, facilities and 0.5 mile of access road would be developed, disturbing 15 acres.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. Habitat would be managed through close coordination with the livestock grazing management plan to ensure adequate wildlife cover and forage, and through prescribed burning to restore the natural vegetative processes. Proposed projects include reducing western juniper on 8,000 acres, interseeding forbs (native and introduced) on 2,740 acres of an existing crested wheatgrass seeding to increase its diversity and value to wildlife, and developing four wildlife guzzlers which would disturb approximately two acres. Western juniper would be selectively reduced by either prescribed burning or chaining and cutting, with prescribed burning being the preferred method. Any acreage burned by wildfire would replace, on an acre-by-acre basis, acreage proposed to be treated.

Livestock Management Actions

An additional 327 AUMs of livestock forage currently available but unallocated would be allocated to livestock. This increase would involve 13,250 acres of the 20,700-acre WSA plus the portions of the pastures extending outside the WSA.

Grazing management would be changed from rest rotation to deferred rotation on the existing crested wheatgrass seeding (2,740 acres). Rest rotation management would continue to be applied to the remainder of the area.

A total of 1.75 miles of riparian fence would be constructed resulting in an early spring/rest riparian grazing treatment on 1.3 miles of Clover Creek. Four reservoirs would be constructed to provide season-long water for improved distribution. As a result, an additional 300 AUMs would be allocated.

Vehicle use for livestock management and maintenance of the 17 miles of fence, 11 existing reservoirs, 3.2 miles of pipeline, a storage tank and water troughs would continue on 14.7 miles of ways. The ways are used five to ten times per year to check livestock, spread salt and maintain facilities.

Watershed Management Actions

Streambank stabilization, which would include juniper riprap and tree planting, would occur along 1.3 miles of Clover Creek to stabilize the stream channel and improve water quality. This would involve cutting juniper trees and placing them along the bank to protect the streambanks from erosion, allowing vegetation to become established. Tree planting would involve placing cuttings of willow and poplar trees into the riparian area during the early spring. Ground disturbance would be approximately 20 acres.

Recreation Management Actions

Vehicle use would continue on the existing 14.7 miles of ways. Current recreational use is estimated to be 150 visitor days per year with most use utilizing vehicles for access into the area. No recreation development is projected.

Summary

Table 1 summarizes the projected management actions under each alternative. Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment.

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA generally appears to be in a natural condition and primarily affected by the forces of nature except the eastern portion due to a 2,740-acre crested wheatgrass seeding. Twenty-five unnatural interior features influence approximately 28 percent of the WSA. These features consist of five fences (23.4 miles), 13 reservoirs, 3.2 miles of buried water pipeline, 1 water storage tank, 3 water troughs and 14.7 miles of vehicle ways. The majority of these features are located in the east portion of the WSA within 2 miles of the boundary.

Unnatural features outside the WSA that affect its naturalness include boundary roads, fences, a powerline, a constructed fireline, mining claims, a bentonite plant, a ranch headquarters and a corral. However, they do not substantially affect the majority of the area's naturalness qualities.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The relatively square shape and size of the study area enhances a visitor's ability to experience solitude in the central portion of the WSA. Rolling topography and a western juniper forest provide both vegetative and topographic screening.

Although recreation use would likely be concentrated in the central portion of the WSA, the topography, size of the WSA and juniper forest provide sufficient space and variety to screen visitors from one another. Much of the topography includes shallow draws, low rolling hills, and scattered rims in the northern portion. Gerry

Mountain, Moon Mountain and Mule Point provide limited diversity of topography. The mid-eastern portions of the WSA have less topographic and vegetative screening.

Outside sights and sounds affecting the WSAs opportunity for solitude are primarily associated with vehicle traffic along the boundary roads and activities and buildings associated with the Weaver and Cold Springs ranches.

Hiking, hunting, nature study, sightseeing, photography and camping are the primary recreational opportunities available within the WSA. However, these opportunities are less than outstanding due to the limited amount of topographic and vegetative diversity.

Special Features

No special or unique features have been identified within the WSA.

Diversity in the National Wilderness Preservation System (NWPS)

Based on the Bailey-Kuchler method of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe with juniper. The WSA contains the western juniper/big sagebrush/ bluebunch wheatgrass, big sagebrush/bluebunch wheatgrass and low sagebrush/Idaho fescue plant communities which are identified in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan.

There are seven standard metropolitan statistical areas with populations over 100,000 within five hours' driving time of the WSA. These population centers include: Medford, Eugene/Springfield, Portland, and Salem, Oregon; Richland/Kennewick/Pasco, and Yakima, Washington; and Boise, Idaho.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by geologists with TERRADATA, a consulting firm under contract with BLM. Technical details of the evaluation are found in a TERRADATA report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Gerry Mountain Geologic Resource Area." This report is supplemented by a BLM evaluation of the same area.

The WSA is located within the Gerry Mountain geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The WSA is within an area of critical mineral potential (ACMP) for oil and gas. Table 3 shows the energy and mineral potential classifications for the WSA. Map 4 shows where energy and mineral resources have moderate and high potential for occurrence within the WSA.

The exposed rocks in the WSA are Tertiary and Quaternary volcanics and volcaniclastic sediments. The subsurface rocks are inferred from oil and gas exploration wells to include Cretaceous marine clastic sediments and Pre-Cretaceous marine and metamorphosed sediments. Depth of these sediments varies from 1,500 to 2,500 feet.

Energy Resources

Oil and gas resources have a high potential for occurrence based on several positive factors. Two deep exploratory wells have been drilled near the WSA. Both wells had oil and gas shows and indicate that marine clastic sediments are probably present beneath the WSA. Other exploratory wells have been drilled in Central Oregon, and all have had hydrocarbon shows. The combination of surface structures, subsurface geology, hydrocarbon shows and persistent exploration efforts all lead to high potential for occurrence of oil and gas in the WSA.

As of October 16, 1987, approximately 18,720 acres within the WSA were leased for oil and gas. There were no geothermal leases in the WSA as of October 16, 1987.

Mineral Resources

A bentonite deposit exists in the northwestern and western parts of the WSA. Zeolite deposits are inferred to occur in this same area. These lands are rated as having a high potential for occurrence of bentonite and a moderate potential for occurrence of zeolites. Bentonite, used as pet waste absorbent, pond sealant and animal feed binder is currently mined adjacent to the WSA.

As of October 16, 1987, there were three mining claims for bentonite/zeolites, covering approximately 60 acres in the northern tip of the WSA.

Vegetation

At present, the vegetation in the majority of the WSA is dominated by western juniper with an understory of low and big sagebrush and grasses. A variety of plants are found within this vegetative complex including bitterbrush, currant, rabbitbrush, bluebunch wheatgrass, Thurber's needlegrass, Idaho fescue, Sandberg's bluegrass, phlox, buckwheat and wild onion. A 2,740-acre area in the eastern portion of the WSA is big sagebrush and crested wheatgrass. The reservoirs in the WSA and Sand Hollow Creek provide for a variety of riparian species including sedges and rushes. Much of the native upland vegetation (16,000 acres) is mid-seral stage with the remainder (2,000 acres) in late seral stage.

There are no known or suspected threatened or endangered plant species in the WSA.

Most of the WSA consists of a historically fire-dependent ecosystem. Frequent wildfires maintained the sagebrush and juniper components at a level less than at present. Through grazing practices, which eliminated some of the fine fuels (i.e., grasses and forbs) needed to carry wildfire and through modern day wildfire suppression, wildfire is no longer a common occurrence in the WSA. As a result, the shrub and tree components of the ecosystem have increased dramatically, decreasing the grass and forb component, and further reducing the occurrence of substantial wildfire.

Wildlife

Habitat condition for wildlife is influenced by the diversity of vegetation types and by the ecological status of those types. Wildlife habitat in the WSA is generally in fair condition. Wildlife use of the Gerry Mountain WSA is restricted by the lack of vegetation diversity and other habitat features, such as natural water sources, canyons and riparian areas which influence use. Most of the WSA is mature juniper woodland or sagebrush which exhibits little variation in age structure or vegetative diversity. About five percent of the WSA is crested wheatgrass seedings which also display low diversity. Habitat condition has been significantly influenced by control of wildfire and livestock grazing.

The control of fire, which normally would reduce the tree and shrub canopy and allow the understory grasses and forbs to increase, has perpetuated the tree/shrub dominance. The longer this dominance continues, the more the cover component increases and the forage component decreases. Therefore, overall wildlife habitat condition declines.

Approximately 20 antelope use the WSA yearlong. Winter use occurs only during the most snow-free winters. Approximately 75 mule deer use the WSA in summer with 230 using it in spring and winter. Elk use in the WSA is yearlong by approximately 10 animals and use is increasing. Nongame species use of the area is below potential due to the lack of water and the present dominance of the western juniper woodland.

Riparian habitat occurs in Sand Hollow Creek in the southeast corner of the WSA, and in Clover Creek in the southwest corner of the WSA. Sand Hollow Creek was fenced into a separate riparian pasture in 1986.

No Federally-listed threatened or endangered wildlife species occur in the WSA but three candidate species (the sage grouse, ferruginous hawk and Swainson' hawk) use the WSA to a limited degree. Historic levels of use by these species was probably higher than at present.

Watershed

The WSA contains two ephemeral streams: Clover Creek (1.3 miles) and Sand Hollow Creek (1.5 miles). Clover Creek is deeply incised, has unstable vertical banks up to 10 feet high, and is heavily impacted by livestock. Sand Hollow Creek is managed as a riparian pasture with early spring/rest livestock grazing designed for riparian improvement. Both streams have the potential to return to perennial flow.

Upland soils are generally in declining condition with low to high erosion hazard. As a result of the extreme dominance by juniper in much of the WSA, there is little herbaceous ground cover to slow rainfall or snowmelt. The tendency then is for water to run down hillsides and carry with it soil, causing sheet (surface) and gully erosion. This rush of sediment-laden water further contributes to erosion of Clover Creek. Removal of juniper in the uplands results in an increase in herbaceous ground cover which improves these conditions.

Livestock Grazing

Portions of two grazing allotments lie within the WSA. Currently, all public lands in the WSA are under permit for livestock grazing. Table 4 summarizes existing livestock use in AUMs. Rest rotation grazing is being applied to all lands in the WSA except for Sand Hollow Creek. It is fenced to provide for a specialized early spring/rest grazing treatment designed to improve the riparian vegetation.

Existing livestock developments include 17 miles of fence, 13 reservoirs and 3.2 miles of pipeline with 3 troughs and 1 storage tank.

Livestock operators use motor vehicles on ways approximately 35 times per year for fence, reservoir and pipeline inspection and maintenance, to check on livestock and to spread salt. Due to topography and the lack of vehicular access to parts of the WSA, much of the livestock management is accomplished on horseback.

Cultural Resources

The WSA's eastern boundary, outside the WSA, corresponds to the Stein's Military Road, a route dating from 1859-60 that originated at Fort Dalles and headed south and east across Oregon. This road is thought to overlay the Meek's Wagon Train route of 1845. It is not known whether there is currently any evidence of these routes on the ground. No historic or prehistoric sites have been recorded in the area.

Recreation Use

Recreation use of the WSA includes backpacking, day hiking, hunting, bird watching, camping, horseback riding, sightseeing and photography. Use of vehicles is limited to existing roads and ways through vehicle use designation and is mainly associated with hunting and sightseeing. A few hunter camps exist near Double Waterhole Reservoir.

Overall recreation use has been light compared to other parts of the district. An estimate of 100 visitor days' use per year was made in 1979. Since the use levels have increased by two to five percent per year, mainly because of increased hunting pressure in this part of the district, the current recreation use level is estimated to be 150 visitor days per year.

Local Personal Income

Livestock use at the current level of 1,565 AUMs and recreation use totaling 150 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $18,800 for livestock grazing and $1,800 related to recreation use of the WSA, for an overall total of $20,600. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness

Recommended suitable for wilderness: 20,700 acres.
Recommended nonsuitable for wilderness: 0 acres.

Impacts on Wilderness Values

All of the WSA would be designated wilderness and wilderness values within the entire 20,700 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive, unconfined recreation would be preserved.

Naturalness

The naturalness of the area's undisturbed plateaus, hills and shallow ravines (72 percent of the WSA is pristine, uninfluenced by any unnatural features) would be enhanced by prohibiting motorized vehicle use. Closure of 14.7 miles of ways, which influence approximately 1,140 acres (5.5 percent of the WSA) would allow the ways to revegetate. These ways would receive periodic use every 10 to 15 years, subject to permit, to provide for maintenance of the water pipeline and 10 reservoirs by heavy equipment. One other reservoir accessible by cross-country use may also require maintenance every 10 to 15 years. Disturbance to naturalness would be very limited since such infrequent use would allow the ways to revegetate. Projected development of one small bentonite claim would directly affect eight acres and visually influence 800 acres. Mineral exploration activities on 640 acres of split-estate lands in the southern portion of the area would temporarily reduce naturalness, but required reclamation would result in generally unnoticeable surface disturbances. Development would not be expected. The proposed fence along Clover Creek, while unnatural in itself, would be allowed because it would protect natural processes, restore deteriorated habitat and be compatible with the wilderness character of the area. The fence would visually influence approximately 150 acres within the immediate area. Prescribed burning of 1,000 acres would be noticeable in the short term. However, this treatment would eventually improve naturalness through restoration of a fire-dependent ecosystem. Construction of two wildlife guzzlers would influence naturalness of one acre.

Solitude

Opportunities for solitude provided by the size, shape, dense juniper forest and topography of the area would be further enhanced by eliminating motorized vehicle use on 14.7 miles of ways. Vehicle use would be limited to the boundary roads. This reduction in vehicle access would provide a large area for visitors to hike into and experience solitude without disturbance from motorized vehicles.

Solitude would be reduced on 1,000 acres where removal of juniper and/or sagebrush would occur. However, since these actions are anticipated to encompass several smaller areas, impacts to solitude in the WSA are expected to be negligible.

Primitive and Unconfined Recreation

Closure of the 14.7 miles of ways to motorized vehicle use would increase opportunities for primitive and unconfined recreation activities such as hiking, backpacking, horseback riding and camping. The quality of photography, nature study and sightseeing experiences would be improved by removing vehicles and allowing the ways to revegetate. A more natural appearing area would be provided.

Construction of the fence along Clover Creek for riparian recovery and two wildlife guzzlers would enhance hunting and wildlife viewing opportunities.

Special Features

There would be no impact to special features since none are known to exist in the area.

Conclusion: Wilderness designation of the entire 20,700 acres within the Gerry Mountain WSA would protect and enhance existing wilderness values.

Impacts on Mineral and Energy Development

Wilderness designation would close 19,980 acres to energy and mineral entry. The 720 acres of split-estate in the WSA would be open to energy and mineral development.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 19,980 acres. Projected development of seven production wells would be precluded. The 720 acres of split-estate might be explored but likely would not be developed due to the lack of known resources in the area.

Conclusion: Production from seven projected oil and gas wells would be foregone.

Mineral Development

The 1,460 acres with high potential for occurrence of bentonite and moderate potential for occurrence of zeolites would be closed to mineral entry. The projected development of one existing claim, which would disturb eight acres, would be anticipated.

Conclusion: One 8-acre bentonite/zeolite mine would be projected to be developed.

Impacts on Vegetation

Since the proposed grazing allocation increase would not be allowed under the all wilderness alternative, based on its potential impacts to wilderness values, existing management, prescribed burning and natural succession would have the greatest effect on vegetation. For 1,000 acres treated by prescribed fire, the ecological status would rapidly change from mid-seral to late seral stage, and the residual ground cover would increase. For 13,500 acres unburned, the ecological status would continue to slowly change from mid-seral to early seral stage. In the long term, livestock utilization would remain at approximately 35 percent.

The construction of 1.75 miles of fence would provide opportunity for specialized early/rest grazing treatments which would improve riparian vegetation along 1.3 miles of Clover Creek. Sand Hollow Creek would show similar improvements due to the similar grazing treatment already in place. Through these specialized treatments, the ecological status would be managed to reach its potential natural community of willow/sedge/grass on Clover Creek and sedge/rush/grass on Sand Hollow Creek.

The 14.7 miles of ways, once closed to vehicles, would begin to revegetate within approximately two growing seasons. Construction of two guzzlers would disturb one acre of vegetation. One projected bentonite/zeolite mine would disturb eight acres.

Conclusion: Without fire the majority of the area (13,500 acres) would continue to slowly change from mid-seral to early seral stage as tree and shrub cover increased. Areas treated with prescribed fire (1,000 acres) would rapidly change toward late seral stage. Riparian vegetation along Clover Creek and Sand Hollow Creek would improve and 14.7 miles of ways would revegetate. Nine acres of vegetation would be disturbed from construction of two guzzlers and one bentonite/zeolite mine.

Impacts on Wildlife

Since it is unlikely that more than 1,000 acres of habitat would be improved by prescribed burning and the untreated acres would decline in condition, the wildlife habitat quality and mule deer population would decline. Construction of two guzzlers would maintain habitat quality in limited areas. The inability to effectively manage the existing seeding and the reduced ability to change existing grazing systems would reduce the forage value of the seeding to wildlife.

The proposed grazing allocation increase would not be allowed resulting in available forage above the level identified to meet ODFW population goals for big game. Residual forage for nesting and cover would be maintained since livestock increases would not occur.

Conclusion: In general, existing wildlife forage conditions overall would be maintained on 20,700 acres in the short term and would be slightly reduced in the long term. Overall wildlife habitat diversity and species diversity would decline. With overall reduced forage levels, management objectives for elk, antelope and mule deer would not be met and big-game populations would decline in the long term.

Impacts on Watershed

The early spring/rest grazing treatments on 1.3 miles of Clover Creek and 1.5 miles of Sand Hollow Creek would reduce streambank trampling, promote establishment of riparian vegetation and leave residual cover in the stream channel. The residual vegetative cover would catch sediment, stabilize banks and rebuild the streambottom. An increase in water quality and quantity would result. Fecal coliform from cattle grazing would be reduced resulting in an improvement of water quality. Upland watershed conditions would improve on 1,000 acres burned. Conditions would decline on the remainder of the area through a change in ecological status toward early seral stage.

Conclusion: Improved riparian condition and livestock management would improve water quality and quantity along Clover and Sand Hollow Creeks. Upland watershed conditions would decline except for 1,000 acres treated by prescribed fire.

Impacts on Livestock Grazing

Livestock use would remain at the current use level of approximately 1,565 AUMs within the portions of two allotments in the WSA. Wilderness designation of the entire WSA would preclude the allocation of 327 AUMs of currently available but unallocated forage in affected pastures, because of the potential adverse impacts upon the area's naturalness. (An additional allocation of 327 AUMs would cause greater utilization of existing vegetation resulting in a more grazed appearance, less residual ground cover and increased trampling.) Increases would not be allowed in pastures entirely or partially within the wilderness area. Four reservoirs would not be constructed and the allocation of 300 AUMs resulting from improved livestock distribution would also be precluded.

Vehicle use for livestock management and facility inspection/maintenance on 14.7 miles of ways would be precluded, resulting in some inconvenience and additional expense to livestock operators. Much of the additional expense would be related to checking and maintaining the water pipeline by horseback. Heavy equipment would be used, subject to permit, once every 10 to 15 years for maintenance of 11 reservoirs and substantial pipeline maintenance.

Conclusion: A potential allocation of 627 AUMs of currently available forage and forage made available through water development would be foregone. Additional expense and inconvenience to the livestock operators would result from the closure of 14.7 miles of ways to vehicles.

Impacts on Recreation Use

Vehicular access to the Double Waterhole hunter camping area and other hunting areas would be eliminated through the closure of 14.7 miles of ways. Hunters would have to traverse the closed ways by foot or horseback. As a result, recreation use would decrease. However, the quality of hunting would increase as a result of the way closures. While sightseers, photographers and birdwatchers would have to walk further to the more remote areas, it would be easier to be isolated from the noises of vehicle traffic which would improve primitive recreation opportunities. Riparian improvement of Clover and Sand Hollow creeks would enhance wildlife viewing opportunities. Overall, there would be a reduction in visitor use by 50 days per year.

Conclusion: The area's recreation use level of 150 visitor days per year, which is increasing at an annual rate of two to five percent, would decrease to 100 visitor days per year. Wilderness designation would result in a change to primitive non-motorized types of recreation use which would be less than the present motorized recreation use.

Impacts on Local Personal Income

Livestock grazing would remain at 1,565 AUMs. Projected mineral development would amount to one non-metallic mine. Overall recreation use would decrease by 50 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of approximately $600 per year, plus an unknown level of increase attributable to the projected mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $600.

Partial Wilderness

Recommended suitable for wilderness: 16,470 acres.
Recommended nonsuitable for wilderness: 4,230 acres.

Impacts on Wilderness Values

For 16,470 acres designated wilderness, wilderness values would be protected by legislative mandate. Wilderness values such as naturalness, solitude and primitive unconfined recreation would be preserved. The remaining 4,230 acres recommended nonsuitable for wilderness would not receive special legislative protection. Wilderness values of naturalness, solitude, and primitive and unconfined recreation would be vulnerable to the effects of other resource management actions, including surface-disturbing energy and mineral exploration and development, additional livestock use and continued vehicle use.

Naturalness

Within the 16,470 acres recommended suitable for wilderness, the naturalness of the undisturbed plateaus, hills and shallow ravines would be enhanced by prohibiting motorized vehicle use. Closure of 6.7 miles of ways, which visually influence 523 acres (slightly less than three percent of the WSA), would allow the ways to revegetate. These ways would receive periodic use every 10 to 15 years for reservoir maintenance, but revegetation would still occur. Projected mineral exploration activities on 640 acres of split-estate lands in the southern portion of the area would temporarily reduce naturalness, but required reclamation would result in generally unnoticeable surface disturbance. Development would not be expected.

Prescribed burning of 900 acres would be apparent in the short term. However, this treatment would eventually improve naturalness through restoration of a fire-dependent ecosystem. Construction of two wildlife guzzlers would be noticeable but would not have a significant effect on naturalness.

The proposed fence along Clover Creek, although unnatural in itself, would be allowed because it would protect natural processes and restore deteriorated habitat. The fence would visually influence approximately 150 acres within the immediate area.

Although naturalness and other wilderness values are already limited in the 4,230 acres recommended nonsuitable for wilderness designation, these values would be vulnerable to the effects of projected management actions. These actions would be expected to include the projected development of one oil and gas well, access road and pipeline (totaling five acres of surface disturbance) and the projected development in the northern part of the WSA of one bentonite/zeolite mine directly affecting 15 acres. While this area is generally screened from the other portions of the WSA by topography and vegetation, approximately 1,200 adjacent acres would be visually influenced by the mine.

In the 1,490 acres recommended nonsuitable for wilderness in the northern part of the WSA, 600 acres of juniper removal (by prescribed fire or other methods) would visually influence naturalness in the short term. In the long term, naturalness would be increased through the restoration of a fire-dependent ecosystem.

In the 2,740 acres recommended nonsuitable for wilderness designation in the eastern part of the WSA, naturalness is already limited due to the existing crested wheatgrass seeding. Naturalness would further be reduced by projected mineral exploration activities on the 80 acres of split-estate lands, by continued vehicle use on 8 miles of ways (visually influencing 624 acres or three percent of the WSA) and by the allocation of 96 AUMs of existing but unallocated forage. This additional use would increase trampling around water sources and would increase utilization of forage, resulting in a slightly more grazed appearance. The projected development of one oil and gas well would directly affect five acres and visually influence 400 acres.

The forb interseeding of this area would reduce naturalness in the short term through surface disturbance and an increased visual contrast between this area and adjacent public lands. In the long term, overall naturalness would improve as a result of introducing a wider diversity of vegetation.

Solitude

For the 16,470 acres recommended suitable for wilderness, opportunities for solitude would be provided by the size and shape of the area, the topography and dense juniper forest. These opportunities would be further enhanced by eliminating motorized vehicle use on 6.7 miles of ways. This reduction in vehicle access would provide an area for visitors to hike into and experience solitude without disturbance from motorized vehicles.

In the 4,230 acres recommended nonsuitable for wilderness, continued vehicle use on 8 miles of ways and human activities associated with projected energy and mineral development, livestock facility inspection and maintenance and forb interseeding would cause repeated impairment of opportunities for solitude within and adjacent to the areas where these activities would occur.

Primitive and Unconfined Recreation

Within the 16,470 acres recommended suitable for wilderness, closure of 6.7 miles of ways to motorized vehicle use would increase opportunities for primitive and unconfined recreation such as hiking, backpacking, horseback riding and camping. By removing vehicles and rehabilitating vehicle ways in this area, the quality of photography, nature study and sightseeing experiences would be improved.

Construction of two wildlife guzzlers and the fence along Clover Creek for riparian recovery would enhance wildlife viewing and hunting opportunities.

Within the 4,230-acre area recommended nonsuitable for wilderness, vehicle use would continue to intrude upon primitive, nonmotorized recreation opportunities in that area.

Special Features

There would be no impact to special features since none are known to exist in the area.

Conclusion: Wilderness designation of 16,470 acres would protect and enhance existing wilderness values. Although wilderness values are limited within the 4,230 acres recommended nonsuitable for wilderness, projected energy and mineral exploration and development activities, including a well and a mine and wildlife projects would impair wilderness values in this area. Approximately 2,000 acres would be influenced with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

A total 15,830 acres would be designated as wilderness and closed to energy and mineral entry. Within the area designated wilderness, a 640-acre split-estate parcel would be open to energy and mineral entry. The remaining 4,230 acres would be open for energy and mineral entry.

Energy Development

Surface-disturbing exploration and development of oil and gas which have a high potential for occurring, would be precluded on 15,830 acres by wilderness designation. Projected development of six wells would be precluded. Oil and gas development of 640 acres of split-estate likely would not occur. One well located in the eastern part of the WSA would be developed.

Conclusion: Production from six projected wells would be foregone. One well would be projected to be developed.

Mineral Development

Wilderness designation would preclude surface-disturbing exploration and development for bentonite and zeolites on 760 acres of the total 1,460 acres with high potential for occurrence of these minerals. In the area recommended nonsuitable for wilderness, the remaining 700 acres would be open to mineral entry and one projected open-pit bentonite/zeolite mine, covering 15 acres, would be anticipated.

Conclusion: One mine would be projected to be developed.

Impacts on Vegetation

Since the proposed grazing allocation increase would not be allowed on land recommended as suitable for wilderness based on the possible impairment of wilderness values, the existing management, prescribed burning and natural succession would have the greatest effect on vegetation in this area. Ninety-six AUMs of the proposed 327 AUM grazing allocation increase would be allowed on 2,740 acres in the eastern portion of the WSA recommended as nonsuitable.

For the area recommended suitable as wilderness, vegetation on 900 acres burned by prescribed fire would rapidly change toward late seral stage. The mid-seral vegetation not burned (approximately 12,000 acres) would continue to slowly change toward early seral stage. Residual ground cover would increase on the burned acres and slowly decrease on the unburned acres. Utilization levels would remain at approximately 35 percent in most areas.

The construction of 1.75 miles of fence would provide opportunity for a specialized early spring/rest grazing treatment which would improve riparian vegetation along 1.3 miles of Clover Creek. Sand Hollow Creek, in the area recommended as nonsuitable, would show similar improvement due to the similar grazing treatment already in place. Through these specialized treatments the ecological status would be managed to reach its potential natural community of willow/sedge/grass on Clover Creek and sedge/rush/grass on Sand Hollow Creek. Within five to ten growing seasons vegetation would reestablish on 6.7 miles of ways that would be closed.

For the area recommended nonsuitable, vegetation on 600 acres treated to reduce juniper would rapidly change toward late seral stage. Forb interseeding would change vegetative composition on 2,740 acres. The remaining 1,000 acres would not change or slowly change toward early seral stage. Residual ground cover would increase on 600 acres treated and would be slightly reduced or remain static on the 2,740-acre seeding due to slight increase in livestock utilization from the additional allocation of 96 AUMs. Improved management of this seeding (deferred rotation) would offset the increased forage allocation. Eight miles of ways would remain open and would not revegetate. Five acres of vegetation would be disturbed as a result of developing one projected oil and gas well, 15 acres would be disturbed in the development of one projected bentonite/zeolite open pit mine and one acre would be disturbed from the development of two guzzlers.

Conclusion: For the area recommended suitable for wilderness, upland vegetation currently in mid-seral stage, treated with prescribed fire, would rapidly change to late seral stage. Non-burned areas would slowly change toward early seral stage as the herbaceous understory decreased and juniper and sagebrush increased in dominance. Riparian vegetation along Clover and Sand Hollow Creeks would improve and 6.7 miles of ways closed to vehicles would revegetate. For the area recommended nonsuitable, species composition would change on 2,740 acres of crested wheatgrass seeding. Rapid change toward late seral status would occur on 600 acres where juniper would be removed. Projected energy, mineral and wildlife developments would disturb 21 acres of vegetation.

Impacts on Wildlife

Since it is unlikely that more than 900 acres of habitat in the area recommended suitable for wilderness would be improved by prescribed burning and untreated acres would decline in condition, the wildlife habitat quality and mule deer population would decline. Construction of two guzzlers would maintain wildlife distribution. The proposed grazing allocation increase would not be allowed resulting in available forage above the level identified to meet ODFW population goals for big game. In the long term this forage level would drop as mentioned previously. Residual forage for nesting and cover would be maintained in the area recommended suitable since livestock increases would not occur.

In the area recommended as nonsuitable, vegetation diversity and forage quality on 2,740 acres recommended as nonsuitable would improve due to forb interseeding of the existing crested wheatgrass seeding and an increase in livestock use (increase in fresh growth). Habitat quality would also improve on 600 acres through reduction in juniper. At the same time residual ground cover for nesting and escape cover would be reduced in the seeding. Wildlife would continue to be disturbed by vehicles and by exploration and development of energy and mineral resources. This disturbance would be minor and limited to the immediate vicinity of the action.

Conclusion: Existing wildlife forage conditions would be improved as a result of prescribed burning and forb interseeding. However, overall wildlife habitat diversity and species diversity in the area recommended suitable would slowly decline as the herbaceous component of the vegetation declines. ODFW management objectives would be met for antelope by this alternative but would not be met for elk and mule deer. Elk and mule deer populations would decline in the long term.

Impacts on Watershed

In the area recommended suitable for wilderness, spring and rest grazing treatments on 1.3 miles of Clover Creek and on 1.5 miles of Sand Hollow Creek would improve riparian vegetation and residual cover. Streambank trampling would be reduced and the stream bottoms would be rebuilt. Water storage would be increased and perennial flows would be restored. Fecal coliform from cattle grazing would be reduced resulting in improved water quality.

Upland watershed conditions would improve on 900 acres and would continue to slowly decline on 12,000 acres as seral status moves toward early seral stage. For the area recommended nonsuitable, upland conditions would improve on 600 acres and slowly decline on 1,000 acres.

Conclusion: Improved riparian condition and livestock management would improve water quality and quantity along Clover and Sand Hollow Creek. Upland watershed conditions would improve on 1,500 acres and decline on 13,000 acres.

Impacts on Livestock Grazing

In the area recommended suitable for wilderness, currently available but unallocated forage in the amount of 231 AUMs would remain unallocated because of the potential adverse impacts upon the area's naturalness. An additional allocation of 231 AUMs would cause greater utilization of existing vegetation resulting in a more grazed appearance, less residual ground cover and increased trampling. Increases would not be allowed in pastures entirely or partially within the wilderness area. Forage allocation increases would not be allowed in pastures entirely or partially within the area recommended as suitable for wilderness. In addition, 300 AUMs of livestock forage would be foregone since construction of four reservoirs would be precluded under this alternative. A total of 6.7 miles of ways would remain closed.

In the area recommended nonsuitable for wilderness, livestock use would be increased by 96 AUMs in the crested wheatgrass seeding through allocation of currently available but unallocated forage. This higher level of grazing and improved management would provide better quality livestock forage in this area. Eight miles of ways that remain open would allow maintenance of one reservoir, the storage tank, 3.2 miles of water pipeline and three troughs by vehicle.

Conclusion: For the area recommended suitable, 231 AUMs of existing but unallocated forage would be foregone as well as 300 AUMs from potential reservoir development. Vehicle access would be precluded on 6.7 miles of ways with slight inconvenience and cost to the livestock operators. For the area recommended nonsuitable for wilderness, an additional 96 AUMs would be allocated to livestock.

Impacts on Recreation Use

Vehicular access to the Double Waterhole hunter camping area and other hunting areas within the area recommended suitable for wilderness would be eliminated through the closure of 6.7 miles of ways. While sightseers, photographers and birdwatchers would have to walk farther to the more remote areas, it would be easier to be isolated from the noises of vehicle traffic which would improve primitive recreation opportunities. Wildlife viewing opportunities would increase in Clover and Sand Hollow creeks as the riparian condition improves. Existing vehicle and other uses would continue on the area recommended as nonsuitable for wilderness.

Conclusion: The area's recreation use level of 150 visitor days per year, which is increasing at an annual rate of two to five percent, would have a decrease of 30 visitor days per year. There would be a change to primitive nonmotorized types of recreation use on the portion of the area designated as wilderness.

Impacts on Local Personal Income

Livestock grazing would increase by 96 AUMs. Projected energy and mineral development would amount to one oil and gas production well and one non-metallic mine. Overall recreation use would decrease by 30 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of approximately $800 per year plus an unknown level of increase attributable to the projected mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $800.

No Wilderness/No Action (Proposed Action)

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 20,700 acres

Impacts on Wilderness Values

Under this alternative, none of the 20,700 acres would be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be subject to the effects of the projected management actions. Projected actions include: energy and mineral exploration; the development of an estimated seven oil and gas wells and one bentonite/zeolite mine; vehicle use limited to existing ways for livestock management and facility inspection and maintenance; an allocation of 327 AUMs of livestock forage currently available but unallocated; construction of four livestock reservoirs and the allocation to livestock of 300 AUMs resulting from the reservoir construction; forb interseeding of an existing crested wheatgrass seeding encompassing 2,740 acres; juniper reduction on 8,000 acres; four wildlife guzzlers and continued recreational vehicle use on existing ways.

Naturalness

Vehicle use on the 14.7 miles of ways would continue the impact of vehicle tracks upon naturalness on approximately 1,140 acres (5.5 percent of the WSA). Most of this influence upon the area's naturalness would occur within the central, eastern and northern portion of the WSA. Short and long-term impacts to naturalness would result from seven projected oil and gas wells involving 20 acres of direct disturbance and visually influencing 900 acres, one bentonite/zeolite mine directly affecting 15 acres and visually influencing 1,200 acres, four livestock reservoirs directly affecting eight acres and visually affecting 100 acres, 1.3 miles of streambank stabilization directly affecting 20 acres and visually affecting 80 acres, and forb interseeding affecting 2,740 acres. The allocation of an additional 627 AUMs would increase trampling around water sources and increase the utilization of forage resulting in a more grazed appearance with a reduced amount of residual ground cover. Reduction of juniper on 8,000 acres would have a short-term effect on naturalness but in the long term would result in a more natural appearing landscape.

Construction of 1.75 miles of riparian fence and streambank stabilization on 1.3 miles of drainage would improve naturalness on Clover Creek in the long term by helping to restore the riparian habitat. The fence, although an unnatural feature, would serve to improve overall naturalness of the riparian area through better management of livestock grazing. Approximately 150 acres within the immediate vicinity of the fence would be visually influenced. Four wildlife guzzlers influencing approximately two acres would create short-term surface disturbance, but would be screened by topography and juniper trees.

Solitude

Human activity associated with energy and mineral development, prescribed burning or other treatment of vegetation and continued motorized vehicle use on 14.7 miles of ways would cause repeated impairment of solitude opportunities adjacent to the activity. Vehicle use primarily occurs in the central, eastern and northern portions of the WSA. Opportunities for solitude would remain in the central portion where shallow ravines and dense stands of juniper exist.

Primitive and Unconfined Recreation

The projected activities described in the previous section (Solitude) would also reduce primitive, non-motorized recreation opportunities within and adjacent to the area of activity. Construction of the riparian fence, four wildlife guzzlers, and 1.3 miles of riprap and tree planting would improve opportunities for primitive and unconfined recreation associated with riparian and wildlife enhancement, such as bird watching, hunting and camping in a generally natural setting.

Additional livestock use would increase vegetation removal, trampling, fecal deposits and fouling of water, particularly near reservoirs where recreationists also concentrate.

Special Features

There would be no impact to special features since none are known to exist in the area.

Conclusion: In the absence of wilderness designation, projected management activities would directly and indirectly impair wilderness values on approximately 3,500 acres of this WSA with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire 20,700-acre WSA would be open to energy and mineral entry.

Energy Development

Exploration and development for oil and gas, which have a high potential for occurrence in the WSA, would be allowed. Based on favorable geologic conditions combined with direct evidence of hydrocarbon reserves from nearby drilling, development of seven oil and gas wells is projected.

Conclusion: Production from seven projected oil and gas wells would occur.

Mineral Development

Mineral entry would be allowed within the WSA. Based on known mineral resources in and adjacent to the WSA, development of one bentonite/zeolite deposit is projected.

Conclusion: Production of bentonite/zeolite from one projected mine would occur.

Impacts on Vegetation

Vegetation would be substantially altered on 8,000 acres where fire or mechanical treatments are introduced. The treated areas would move rapidly toward late seral stage due to the removal of suppressing overstories of shrubs and trees. For approximately 6,000 acres slow change from mid-seral to early seral stage would occur where fire or other treatment is not used. For those areas treated, utilization would decrease and residual ground cover would increase in the long term. For those areas not treated, utilization would slowly increase as residual cover decreases; a result of the long-term increase in tree and shrub species cover.

The construction of 1.75 miles of fence would provide opportunity for early spring/rest grazing treatments which would improve riparian vegetation along 1.3 miles of Clover Creek. Sand Hollow Creek would show similar improvement due to the similar grazing treatment already in place. Through these specialized treatments the ecological status would be managed to reach its potential natural community of willow/sedge/grass on Clover Creek and sedge/rush/grass on Sand Hollow Creek.

Vegetation would be disturbed on 20 acres from the development of seven oil and gas wells, on 15 acres from the development of an open pit bentonite/zeolite mine, on 8 acres from the development of four livestock reservoirs, on 20 acres from streambank stabilization on Clover Creek and on 2 acres from the development of four wildlife guzzlers.

Conclusion: Ecological status of 8,000 acres would change rapidly toward late seral stage as a result of prescribed burning or other treatment. Approximately 6,000 acres not treated would continue to slowly change toward early seral stage. Species composition of 2,740 acres would change as a result of forb interseeding. Riparian vegetation along 1.3 miles of Clover Creek and 1.5 miles of Sand Hollow Creek would be improved. Vegetation would be disturbed on 65 acres from energy and mineral development and from watershed and wildlife projects. There would also be a slight increase in livestock utilization with a corresponding, short-term decrease in residual cover.

Impacts on Wildlife

Mineral exploration and development would disturb wildlife in the immediate vicinity of the work. The additional grazing allocation of 627 AUMs would leave sufficient forage to exceed ODFW goals and antelope, mule deer and elk would increase.

Habitat diversity and forage quality for big game would improve on 10,700 acres as a result of prescribed burning, forb interseeding of an existing crested wheatgrass seeding and reduction of western juniper. Habitat availability would improve as a result of guzzler and reservoir installation.

Conclusion: Overall wildlife diversity would be enhanced, mainly through vegetative manipulation projects. Minor disturbance to wildlife would occur from mineral exploration and development. ODFW management objectives would be exceeded by this alternative and big-game populations would increase.

Impacts on Watershed

Early spring/rest grazing treatments on Clover and Sand Hollow Creeks would improve riparian vegetation and residual cover and reduce streambank trampling to stabilize the streambanks and rebuild the stream bottoms, affecting 2.8 miles of streams. Improvement would be accelerated on Clover Creek as a result of streambank stabilization. As a result, water storage would be increased, perennial flows would be reestablished and fecal coliform would be reduced. Water quality would be improved.

Upland watershed conditions would improve on 8,000 acres as a result of juniper reduction and would remain stable or decline on 12,700 acres.

Conclusion: Riparian conditions and water quality and quantity would improve on 2.8 miles of streams. Upland watershed conditions would improve where vegetation manipulations would occur.

Impacts on Livestock Grazing

Presently available but unallocated forage would be allocated resulting in an increased forage allocation of 327 AUMs within the affected pastures. Vehicle use for livestock management and facility inspection/ maintenance would continue on 14.7 miles of ways.

The construction of four new reservoirs would improve livestock distribution, production and management opportunities. Increased forage availability through additional water development would result in the allocation of an additional 300 AUMs. The change in management to deferred rotation would improve forage quality on 2,740 acres.

Conclusion: An additional allocation of 627 AUMs would be realized. Livestock distribution and management would be improved.

Impacts on Recreation Use

Motorized recreation use would continue on 14.7 miles of ways. Vehicle access for day hikes into the more primitive areas and for vehicle oriented hunting would continue. The natural setting for recreational opportunities would be disturbed by energy and mineral development. Overall, minor declines in primitive recreation opportunities would be offset by minor increases in vehicle-dependent activities, thus maintaining current use trends.

Conclusion: The area's overall recreation use level of 150 visitor days per year, which is increasing at an annual rate of two to five percent, would not be affected.

Impacts on Local Personal Income

Livestock grazing would increase by 627 AUMs. Projected energy and mineral development would amount to seven oil and gas production wells and one non-metallic mine. Overall recreation use would remain at 150 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $7,500 per year plus an unknown level of increase attributable to the projected energy and mineral development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $7,500.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (no wilderness/no action), wilderness values would continue to be adversely affected by vehicle use on 14.7 miles of ways and by the projected development of seven oil and gas wells and one open-pit bentonite/zeolite mine. Proposed management actions consisting of the development of four wildlife guzzlers and four reservoirs would also adversely affect these wilderness values. In the long term, vegetation would be disturbed on 50 acres and an additional 2,200 acres would be visually influenced.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, existing uses would continue and additional uses would occur. Short-term impacts to vegetation through juniper/sagebrush reduction on 8,000 acres and streambank stabilization on Clover Creek would be offset by an increase in long-term productivity of renewable resources (livestock and wildlife forage and habitat, watershed values). The long-term productivity of nonrenewable resources (energy and minerals) would decrease. Wilderness values would decrease directly on 50 acres and indirectly influence 2,200 acres.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action, oil and gas reserves produced from seven oil and gas wells and bentonite/ zeolites produced from one mine would be irreversibly and irretrievable committed. Wilderness values would decrease on 2,200 acres.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area is capable of being managed to preserve its wilderness characteristics. Manageability would be enhanced if the mineral estate of the split-estate parcels and the private inholdings were acquired. Acquisition would prevent potential adverse effects from incompatible surface-disturbing activities.

A substantial manageability problem could also result from the maintenance and redevelopment of existing livestock developments including reservoirs, fence and buried pipeline. These developments could be maintained by mechanized equipment if there were no practical alternative. They could also be reconstructed, if needed, to maintain current levels of livestock grazing.

Rationale for Selection of the Proposed Action

The no wilderness/no action alternative is the proposed action because of the area's high oil and gas potential. It is probable that up to seven oil and gas wells could be developed in the WSA. In addition, nonconforming projects are needed for the improvement of watershed conditions (streambank stabilization), as well as guzzlers and reservoirs for wildlife and livestock, and some means of extensive juniper/sagebrush control to maintain the productive capability of the area. Motorized vehicle travel is also needed on 8 miles of ways for maintenance of rangeland developments. These uses would not be allowed if the area was designated as wilderness. Therefore, all of the Gerry Mountain WSA is recommended nonsuitable as wilderness. While this area generally remains in a natural condition and offers outstanding opportunities for solitude, the wilderness values do not outweigh the value of the area for potential mineral development or the need for wildlife, watershed and range developments.

6. Summary and Analysis of Public Comments

The following is a summary of public comments and responses to those comments specific to this WSA. They deal with the adequacy of the analysis in this appendix. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analyses are addressed in the Statewide volume.

Comment: How does petroleum potential in this WSA compare with nearby non-WSA land? An inadequate energy/mineral analysis was done. **Response:** Oil and gas potential for nearly 1,000,000 acres of land in this locale is similar to the Gerry Mountain WSA. Inventory data for minerals/energy resources were summarized in this document. The complete inventory is available for review in the district office.

Comment: This WSA contains the original wagon road from the Snake River Canyon and was not adequately addressed in the EIS. **Response:** The county road that forms the eastern boundary of the WSA corresponds roughly to about four miles of the Steens Military Road, a route that dates to 1859. It is uncertain whether any traces of the original route exist, after decades of subsequent road maintenance. In any case, the road forms a boundary of the WSA and therefore is not within the WSA and would not be affected by any of the alternatives.

Comment: T & E plant *Rorippa columbiae* may be present and was not addressed along with nine other Oregon Natural Heritage Data Base (ONHDB) plants. **Response:** The WSA may be within the range of *Rorippa columbiae*. However, present evidence suggests its preferred habitat is either washed gravel along river courses (as along the Columbia River) or alkaline vernal pools. Neither exists in the WSA and therefore this plant is not suspected. Existing information and plant inventory in areas adjacent to the WSA do not support the inclusion of any other ONHDB plants on a list of suspected plants in the WSA.

Comment: A lack of juniper control will hurt livestock operations. **Response:** Projects which would result in an increase in livestock use would not be initiated in the area recommended suitable for wilderness in the all wilderness or partial wilderness alternatives. However, the proposed action (no wilderness/no action) would allow extensive juniper control, primarily for wildlife, but which would also maintain existing levels of livestock use.

Comment: Gerry Mountain WSA should be combined with the adjacent Sand Hollow WSA. **Response:** See Chapter 2, Description of the Alternatives, for discussion of the alternatives not analyzed.

Table 1. Summary of Proposed Management Under Each Alternative, Gerry Mountain WSA (OR-5-35)

Proposed Management	All Wilderness	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	20,700	16,470	0
Acres Closed to ORVs by Wilderness Designation[1]	20,700	16,470	0
Miles of Ways Closed	14.7	6.7	0
Energy/Minerals Actions			
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	19,980	15,830	0
Roads constructed (miles)	0.5	1.5	5.5
Oil and gas pipelines (miles)	0	1	5
Drill Sites (number)	0	1	7
Mine Sites (number)	0	1	1
Structural Wildlife Projects Developed: Guzzlers	2	2	4
Nonstructural Wildlife Projects Developed:			
Brush Control w/o Seeding (including juniper control)	1,000	1,500	8,000
Forb Interseeding (acres)	0	2,740	2,740
Watershed Projects Developed: Juniper Riprap & Tree Planting (miles)	0	0	1.3
Structural Livestock Projects Developed:			
Fences (Miles)	1.75	1.75	1.75
Reservoirs (Number)	0	0	4
Unallocated Existing Forage Allocated (AUMs)	0	96	327
Increased Forage Allocation from Projects (AUMs)	0	0	300

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[1] Except for 14.7 miles of ways in the WSA, most of the acreage shown is already closed to cross country vehicle use through a "limited" ORV designation.

Table 2. Summary of Environmental Consequences of Alternatives, Gerry Mountain WSA (OR-5-35)

Resource or Activity	All Wilderness	Partial Wilderness	No Wilderness/No Action (Proposed Action)
Wilderness Values	Wilderness designation of 20,700 acres would protect and enhance existing wilderness values.	Wilderness designation of 16,470 acres would protect and enhance existing wilderness values. Wilderness values on 4,230 acres recommended nonsuitable would be impaired as a result of projected management actions.	Projected management actions would impair wilderness values on approximately 3,500 acres with further declines from other potential uses over the long term.
Energy & Mineral Development	Projected production from seven oil and gas wells and production from one open-pit bentonite/zeolite mine would be foregone.	Projected production from six oil and gas wells would be foregone. Projected production from one oil and gas well and one bentonite/zeolite mine would occur.	Projected production from seven oil and gas wells and one bentonite/zeolite mine would occur.
Vegetation	In the short term, vegetation preserved in present state except for 1,000 acres where ecological succession would be accelerated. In the long term, 13,500 acres of untreated vegetation would move toward early seral stage. Riparian vegetation along Clover and Sand Hollow creeks (total 2.8 miles) would improve and 14.7 miles of ways would revegetate. Nine acres would be disturbed from wildlife projects and bentonite/zeolite mining.	In the short term, vegetation preserved in present state except for 1,500 acres where ecological succession would be accelerated. In the long term, 13,000 acres would move toward early seral stage. Riparian vegetation along Clover and Sand Hollow creeks (total 2.8 miles) would improve and 6.7 miles of ways would revegetate. Species composition would change on 2,740 acres interseeded to forbs. Energy, mineral and wildlife developments would disturb 21 acres.	In the short term, vegetation preserved in present state except for 8,000 acres where ecological succession would be accelerated. In the long term, 6,500 acres of untreated vegetation would move toward early seral stage. Riparian vegetation along Clover and Sand Hollow creeks (total 2.8 miles) would improve. Species composition would change on 2,740 acres interseeded to forbs. Utilization of vegetation by livestock would increase in some areas and decrease in other areas. Vegetation on 65 acres would be disturbed as a result of project construction and development.
Wildlife	Wildlife forage conditions, habitat diversity and species diversity would decline.	Wildlife forage conditions would slightly improve. Habitat diversity and species diversity would slowly decline.	Overall wildlife diversity would be enhanced. Minor disturbance to wildlife would occur.
Watershed	Water quality and quantity in Clover and and Sand Hollow creeks (total 2.8 miles) would improve. Upland conditions would decline except for 1,000 treated by prescribed fire.	Water quality and quantity in Clover and Sand Hollow creeks (total 2.8 miles) would improve. Upland conditions would improve on 1,500 acres and be less stable in the long term on 13,000 acres.	Water quality and quantity in Clover and Sand Hollow creeks (total 2.8 miles) would improve. Upland conditions would improve on 8,000 acres but would remain stable or decline on 12,700 acres.

Table 2. Summary of Environmental Consequences of Alternatives, Gerry Mountain WSA (OR-5-35) (continued)

Resource or Activity	All Wilderness	Partial Wilderness	No Wilderness/No Action (Proposed Action)
Livestock Grazing	327 AUMs of currently available but unallocated forage and 300 AUMs of forage dependent on reservoir development would be foregone. Vehicle use on 14.7 miles of ways would be precluded and 1.75 miles of riparian fence would be constructed, resulting in some inconvenience and a slight increase in costs to livestock operators.	96 AUMs of currently available but unallocated forage would be allocated; 231 AUMs of existing but unallocated forage, and 300 AUMs of forage made available through reservoir development would be foregone. Vehicle access on 6.7 miles of ways would be precluded and 1.75 miles of riparian fence would be constructed, resulting in some inconvenience and a slight increase in in costs to livestock operators.	327 AUMs of currently available but unallocated forage would be allocated. Some inconvenience and a slight increase in costs to livestock operator would result from construction of 1.75 miles of riparian fence. Additional water developments would result in the allocation of an additional 300 AUMs.
Recreation Use	Overall recreation use level would decrease by 50. There would be a change to primitive non-motorized types of recreation use.	The area's overall recreation use level would be reduced by 30. There would be a change from types of recreation requiring a motorized vehicle to primitive non-motorized types of recreation use.	There would be no change in the level or type of existing use.
Local Personal Income	Annual local personal income would decrease by approximately $600.	Annual local personal income would increase by approximately $800.	Annual local personal income would increase by approximately $7,500.

Table 3. Classification of Energy and Mineral Potential, Gerry Mountain WSA (OR-5-35)

Commodity	Area	Level of Potential	Level of Certainty
Metals (zinc, tungsten, beryllium)	Entire WSA	L	B
Diatomite	Entire WSA	L	C
Limestone	Entire WSA	L	C
Zeolites	See map 4	M	C
	Rest of WSA	L	C
Bentonite	See map 4	H	D
	Rest of WSA	L	C
Uranium/Thorium	Entire WSA	O	B
Geothermal	Entire WSA	O	C
Oil/Gas	Entire WSA	H	C
Sodium/Potassium	Entire WSA	L	B
Coal	Entire WSA	O	B
Tar Sands/Oil Shale	Entire WSA	O	B
Sand/Gravel	Entire WSA	L	C
Crushable Rock	Entire WSA	L	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

Table 4. Existing Livestock Use, Gerry Mountain WSA (OR-5-35)

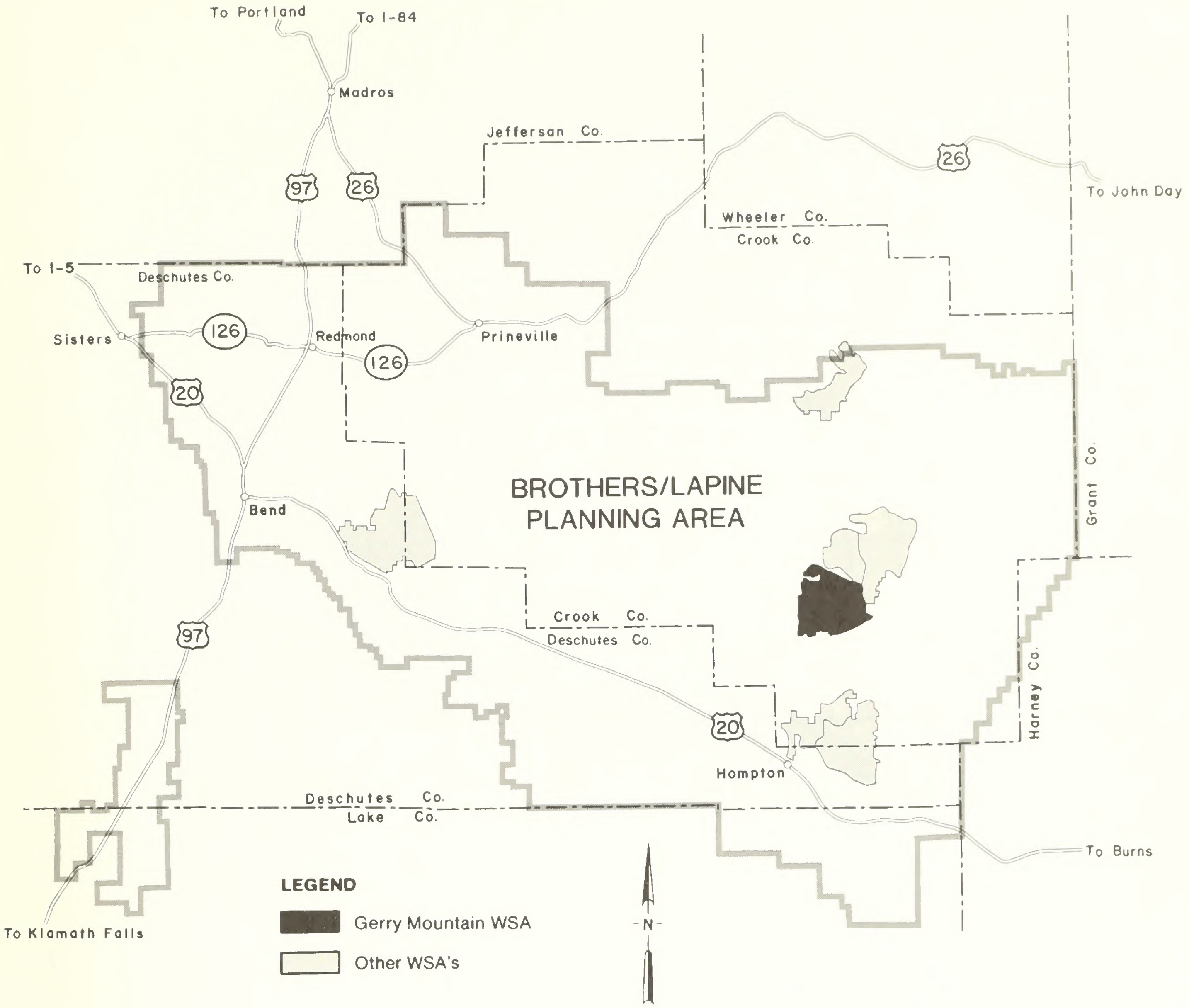
Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allotment in WSA	Current Estimated use in WSA (AUMs)
Clover Creek (No. 0070)	617[1]	04/16-11/15	35	207
Cold Springs (No. 0009)	2,253[2]	04/16-10/31	64	1,358
TOTAL	2,870		1,565	

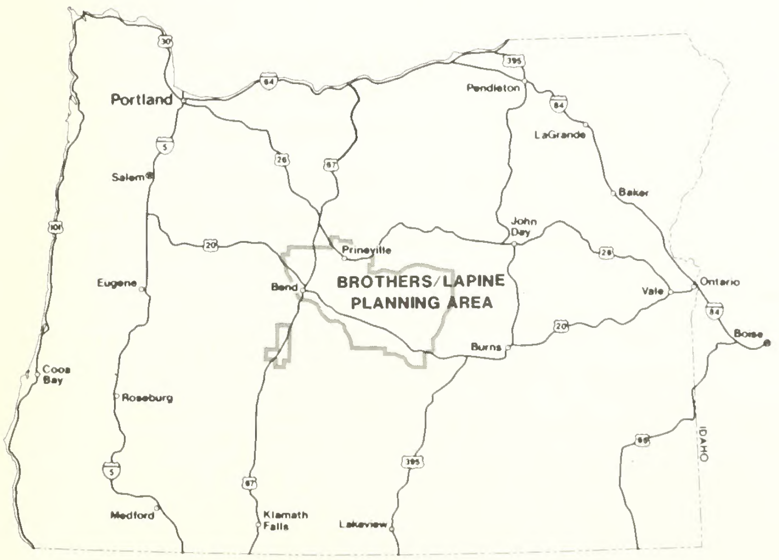
[1] AUMs changed due to acquisition of additional lands outside WSA.

[2] AUMs shown in Draft EIS and Supplement were in error.

Table 5. Effects of Alternatives on Local Personal Income, Gerry Mountain WSA (OR-5-35) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial Wilderness	No Wilderness/ No Action (Proposed Action)
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	+96	+627
Energy & Mineral Development:				
Oil & Gas Production Wells	Number	No change	+1	+7
Non-Metallic Mines	Number	+1	+1	+1
Recreation Use	RVD	-50	-30	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	No change	+1,200	+7,500
Energy & Mineral Development:				
Oil & Gas Production Wells	$	No change	Unknown	Unknown
Non-Metallic Mines	$	Unknown	Unknown	Unknown
Recreation Use	$	-600	-400	No change
Total	$	-600	+800	+7,500





U. S. Department of the Interior
Bureau of Land Management

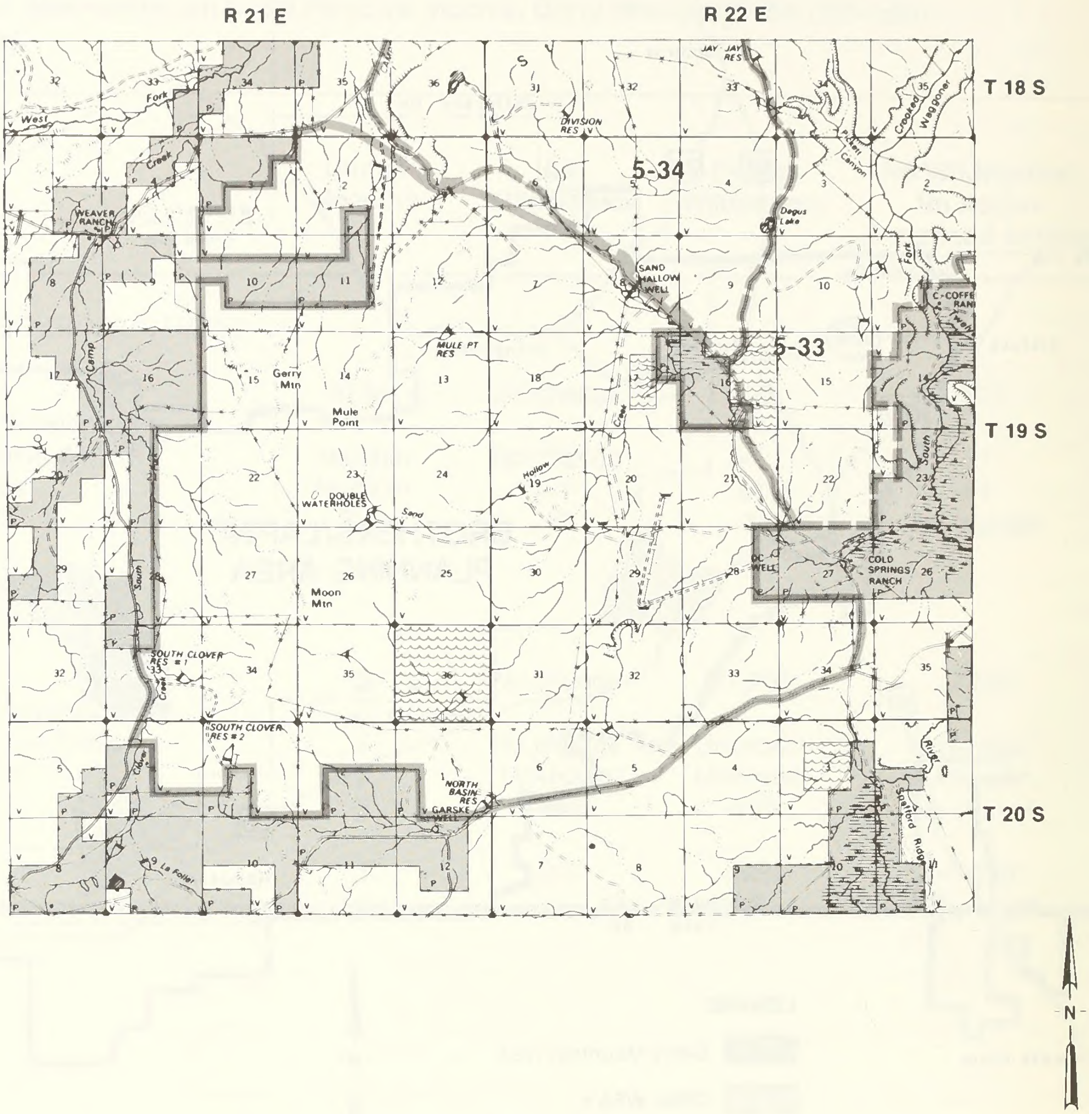
Prineville District

Gerry Mountain WSA
OR-5-35

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

━ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

U. S. Department of the Interior
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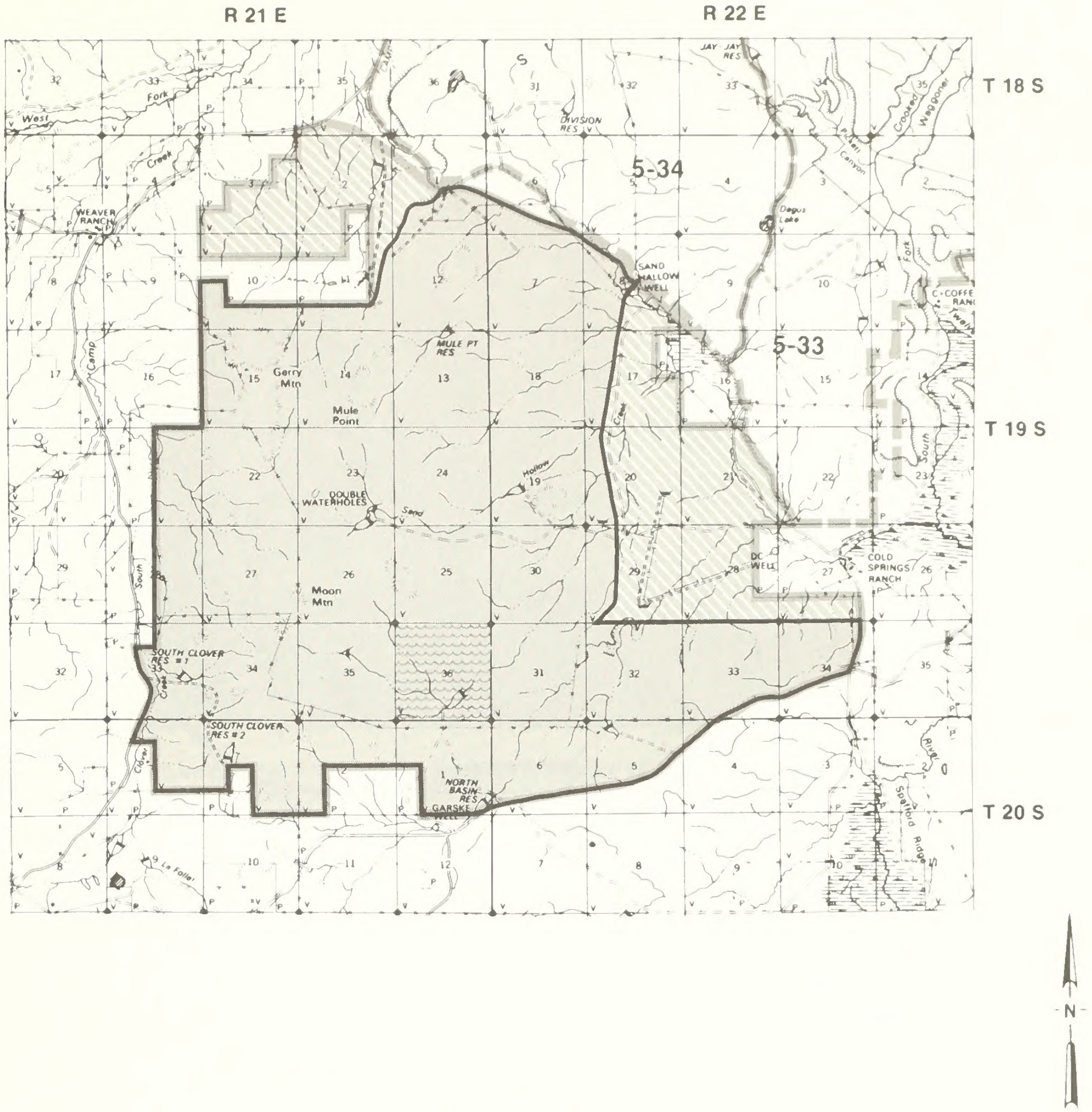
Prineville District

Gerry Mountain WSA
OR-5-35

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▤ Non-Federal Minerals (Split Estate)
within Area Recommended for Wilderness

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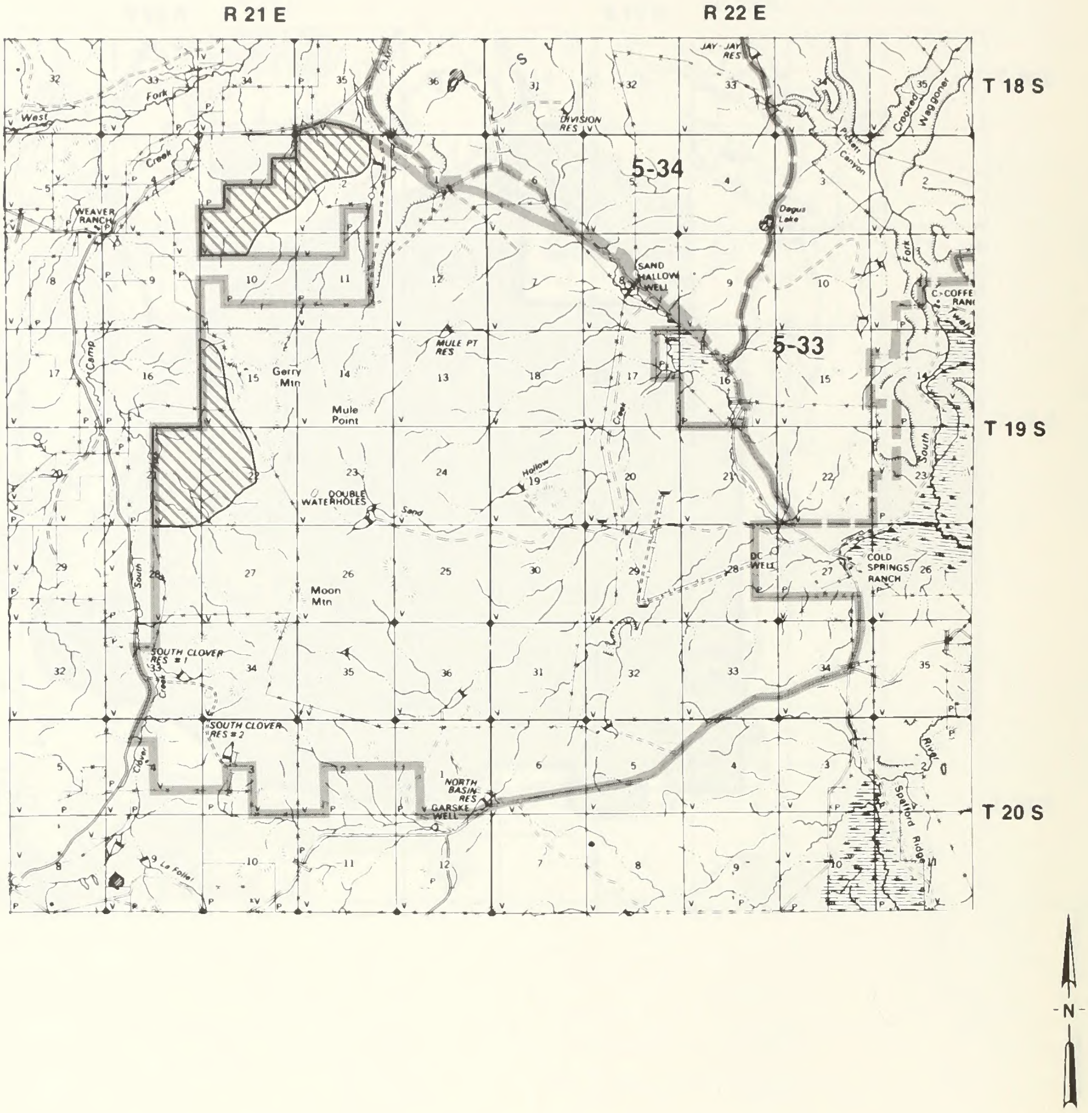
Gerry Mountain WSA
OR-5-35

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



▨ **High Potential (HD) for Bentonite**
Moderate Potential (MC) for Zeolites

Entire WSA:
High Potential (HC) for Oil and Gas

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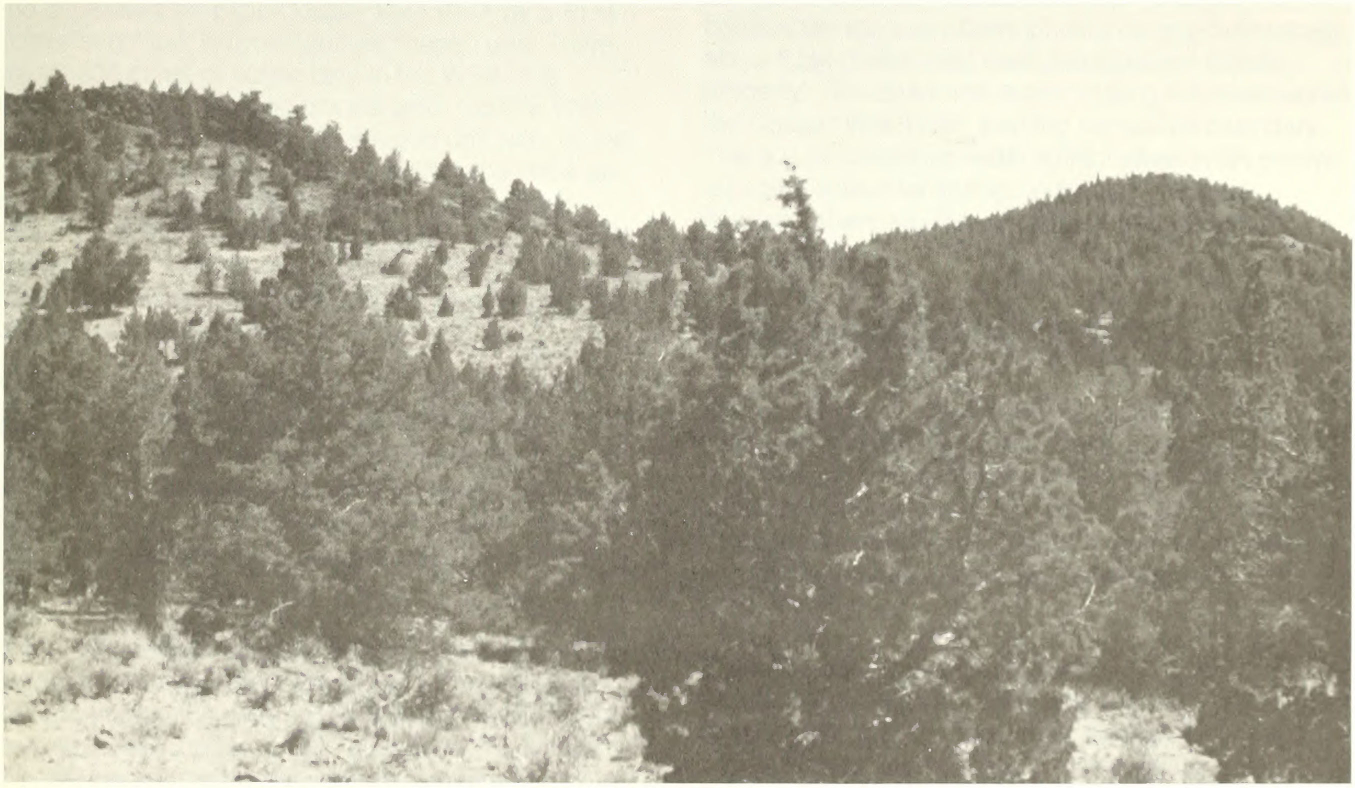
Prineville District

Gerry Mountain WSA
OR-5-35

MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

MAP 4

Gerry Mountain WSA, OR-5-35. Looking north toward the northern boundary of the WSA (the valley bottom and hills in the background are not within the WSA). Within area recommended nonsuitable under the partial alternative and proposed action (no wilderness/no action alternative). Typical scenery in the northern portion of the WSA. June 1979.



Gerry Mountain WSA, OR-5-35. Looking south toward Mule Point in the northwestern portion of the WSA. Within area recommended suitable under the partial alternative and nonsuitable under the proposed action (no wilderness/no action alternative). Typical scenery in the northern portion of the WSA. June 1979.

Gerry Mountain WSA, OR-5-35. Looking east toward the G.I. Ranch Road (the background is not within the WSA). Within area recommended nonsuitable under the partial and proposed action (no wilderness/no action) alternative. Typical scenery of the eastern and central portions of the WSA. June 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Hampton Butte (OR-5-42) and Cougar Well (OR-5-43) Wilderness Study Areas

1. Introduction

General Description of Study Areas

The Hampton Butte and Cougar Well Wilderness Study Areas (WSAs) are in Crook and Deschutes Counties, approximately 60 miles southeast of Bend, Oregon, and about 180 miles southeast of Portland, Oregon. U.S. Highway 20 is less than 4 miles south of the two study areas (see Map 1).

The Hampton Butte WSA, immediately to the west and separated from the Cougar Well WSA by a BLM-maintained road, is an irregularly shaped unit. There are 10,600 acres of public land in the WSA. It is surrounded by public and private land. Cougar Well WSA is a roughly rectangular-shaped unit with 18,435 acres of public land (see Map 2). Within the WSA are 800 acres of private land and 1,120 acres of split-estate inholdings (Federally-managed surface, private or State-owned subsurface mineral rights). Public land interspersed with a few tracts of privately owned land surrounds the WSA.

There are 160 acres of private land at the end of a dead-end road in the Hampton Butte WSA and 240 acres of private land at the end of a dead-end road in the Cougar Well WSA. The parcels are not inside the WSAs because the WSA boundaries extend along the dead-end roads, but both parcels are surrounded by BLM land.

In the Hampton Butte WSA, a series of foothills rise to a rugged Columbia River basalt rim on the edge of a large plateau in the south-central portion of the WSA. Several smaller buttes in the southern portion of the area are part of the Hampton Buttes, located northwest of the WSA. Dense stands of juniper dominate the southern and eastern portions. The understory is sagebrush, rabbitbrush and bitterbrush.

The eastern half of Cougar Well WSA slopes toward the east and is bisected by a small canyon. In the western portion, low foothills join a series of minor mountains known as Hampton Buttes. Vegetation is a big sagebrush/bunchgrass community.

Boundaries on all sides of the Hampton Butte WSA are formed by a combination of BLM-maintained roads and private property. One dead-end road enters the Hampton Butte WSA, for 1.4 miles, forming part of the boundary.

The western and southern boundaries of the Cougar Well WSA are a combination of BLM-maintained road and a power transmission line with a bladed maintenance road. The eastern and northern boundaries are a combination of a county-maintained and a BLM-maintained road and adjacent private property. Two dead-end roads totaling 5.2 miles enter the Cougar Well WSA, forming part of the boundary. There is no perennial water within either WSA except for some scattered springs in Hampton Butte; however, there are five reservoirs and a livestock water pipeline.

Interrelationships

All of the Hampton Butte and Cougar Well WSA complex fall within lands which were ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. The treaty reserved to the Indians rights for hunting, fishing and gathering in usual and accustomed places and grazing livestock on unclaimed lands.

The WSA complex is located in the Oregon Department of Fish and Wildlife's (ODFW) Maury Wildlife Unit. The WSA complex supports summer populations of approximately 70 mule deer, 60 antelope and 20 elk and winter populations of approximately 90 mule deer, 300 antelope and 20 elk. ODFW management goals for mule deer and elk are being met, and for antelope, exceeded. The goal for non-game wildlife is to maintain populations of naturally-occurring species at self-sustaining levels. The proposed action for this WSA complex exceeds ODFW's management goals for game and non-game species.

Crook and Deschutes Counties have not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- impacts on proposed livestock and wildlife projects in the WSAs,
- impacts on the use of vehicles for livestock management, and
- impact on existing oil and gas leasing and future exploration and development.

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made. The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (proposed action)

A partial alternative is not analyzed because no feasible opportunity exists to reduce conflicts of wilderness designation with other resource uses by recommending portions of the WSAs as suitable and still retain necessary wilderness qualities.

An opportunity exists to close the BLM-maintained road between the Hampton Butte and Cougar Well WSAs and manage the two areas as a single unit, if they were both designated as wilderness. This is analyzed in the enhanced wilderness alternative.

Another alternative which would combine these two WSAs with other adjacent public lands separated by existing roads is not analyzed; the roads are important local traffic routes and closing them would not be feasible.

All Wilderness

Under the all wilderness alternative, 10,600 acres of public land in the Hampton Butte WSA and 18,435 acres of public land in the Cougar Well WSA would be recommended suitable as wilderness areas (see Map 2). A total of 24.3 miles of ways would be closed. All boundaries of the Hampton Butte WSA are a combination of private land and bladed roads.

The north, east and west boundaries of the Cougar Well WSA are also a combination of private land and bladed roads. The south boundary is a power transmission line with a bladed maintenance road.

Energy and Mineral Development Actions

Wilderness designation would close 10,600 acres in the Hampton Butte WSA and 17,315 acres in the Cougar Well WSA to energy and mineral entry. Split-estate land totaling 1,120 acres in the Cougar Well WSA would be open to energy and mineral exploration and development. Surface-disturbing exploration and development of energy and mineral resources would be prohibited on a total of 27,915 acres.

The 1,120 acres of split-estate lands in the Cougar Well WSA have high potential for the occurrence of oil and gas and exploration would be permitted. However, in the absence of known oil and gas deposits, no mining claims, only casual, non-surface disturbing exploration with no development is projected.

Wildlife Habitat Management Actions

For both the Hampton Butte and Cougar Well WSAs, habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with guidelines established in the Bureau's Wilderness Management Policy. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Prescribed burning of juniper and sagebrush is proposed in both WSAs (1,000 acres in Hampton Butte and 3,000 acres in Cougar Well). This burning is necessary to maintain the natural condition of the existing fire-dependent ecosystem and would be allowed under wilderness designation. It will be done utilizing existing fire breaks such as roads, topography and vegetation breaks. No surface disturbance would occur as a result of fire line construction. Any acreage burned by wildfire would replace, on an acre-by-acre basis, the acreage proposed for prescribed burning.

Watershed Management Actions

No actions are proposed.

Livestock Management Actions

Livestock use within portions of two allotments in the Hampton Butte WSA would remain at the current level of 775 AUMs and at 1,431 AUMs in a portion of one grazing allotment in the Cougar Well WSA. The season of use for the allotments would remain as identified in Table 4. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 4.8 miles of ways in the Hampton Butte WSA and 19.5 miles of ways in the Cougar Well WSA. Livestock management and maintenance of 6.8 miles of fence and four miles of pipeline in both WSAs would be conducted primarily from horseback. Mechanized heavy equipment would be used, subject to permit, on the average of once every ten to 15 years to maintain five reservoirs.

Recreation Management Actions

The entire 10,600 acres in the Hampton Butte WSA and 18,435 acres in the Cougar Well WSA would be closed to vehicle use except for 1.4 miles of dead-end road in the Hampton Butte WSA and 5.2 miles of dead-end road in the Cougar Well WSA. The 7 miles of road between the WSAs would also be left open. The 4.8 miles of ways in the Hampton Butte WSA and 19.5 miles of ways in the Cougar Well WSA would be closed. At present, vehicle use is limited to these roads and ways within the WSAs. Current recreation use is estimated to be 300 visitor days per year. Most of this current use utilizes vehicles for access to rockhounding and hunting areas.

Enhanced Wilderness

Under the enhanced wilderness alternative, both the Hampton Butte WSA (10,600 acres) and the Cougar Well WSA (18,435 acres) would be recommended suitable as wilderness and combined to form one wilderness area (see Map 3). This combination would require closing 7 miles of road between the two WSAs. The north, east and west boundaries of this area would be a combination of private land and bladed roads. The south boundary would be a combination of a power transmission line, private land and bladed roads.

The private inholdings in Cougar Well WSA totaling 800 acres, the private land at the end of the dead-end roads totaling 400 acres, the private land between the WSAs totaling 320 acres and the 1,120 acres of mineral estate in Cougar Well WSA would be acquired through purchase or exchange with willing landowners. Assuming acquisition of these parcels, the combined wilderness area would contain 30,555 acres. All 6.6 miles of dead-end road protruding into the Cougar Well and Hampton Butte WSAs, as well as 24.3 miles of ways, would be closed.

Energy and Mineral Development Actions

Wilderness designation would close 30,555 acres to energy and mineral entry, assuming acquisition of 1,520 acres of private land (1,200 acres within the WSAs and 320 acres between the WSAs) and 1,120 acres of split-estate land. This would include 10,760 acres in Hampton Butte WSA, 19,475 acres in Cougar Well WSA and 320 acres between the WSAs.

Exploration for energy resources including oil and gas would be prohibited. Exploration for mineral resources would also be prohibited on all 30,555 acres.

Wildlife Habitat Management Actions

For both the Hampton Butte and Cougar Well WSAs, habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and consistent with guidelines established in the Bureau's Wilderness Management Policy. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife.

Prescribed burning of juniper and sagebrush is proposed in both WSAs (1,000 acres in Hampton Butte and 3,000 acres in Cougar Well). This burning is necessary to maintain the natural condition of the existing fire-dependent ecosystem and would be allowed under wilderness designation. It will be done utilizing existing fire breaks such as roads, topography and vegetation breaks. No surface disturbance would occur as a result of fire line construction. Any acreage burned by wildfire would replace, on an acre-by-acre basis, the acreage proposed for prescribed burning.

Watershed Management Actions

No projects are proposed under this alternative.

Livestock Management Actions

Livestock use within portions of two allotments within the Hampton Butte WSA would remain at the current level of approximately 775 AUMs, and at approximately 1,431 AUMs in portions of one grazing allotment in the Cougar Well WSA. The season of use for the allotments would remain as identified in Table 4. Vehicle use for day-to-day livestock management and fence maintenance would be precluded on 4.8 miles of ways in the Hampton Butte WSA and 19.5 miles of ways in the Cougar Well WSA, as well as on 6.6 miles of roads within the WSAs (1.4 miles in Hampton Butte and 5.2 miles in Cougar well) and 7 miles of road between the WSAs. Livestock management and maintenance of 6.8 miles of fence and 4 miles of pipeline in both WSAs would be conducted primarily from horseback. Heavy equipment would be used, subject to permit, on the average of once every 10 to 15 years to maintain five reservoirs, and once every 3 to 5 years to maintain two spring developments and a well on acquired private land.

Recreation Management Actions

The entire 10,760 acres in the Hampton Butte WSA and 19,475 acres in the Cougar Well WSA, as well as 320 acres between the WSAs would be closed to vehicle use. This would include 4.8 miles of ways and 1.4 miles of dead-end road in the Hampton Butte WSA, 19.5 miles of ways and 5.2 miles of dead-end roads in the Cougar Well WSA and 7 miles of road between the WSAs. At present, vehicle use is limited by ORV designation to these roads and ways within the WSAs. Current recreation use is estimated to be 300 visitor days per year. Most of this current use utilizes vehicles for access to rockhounding and hunting areas.

No Wilderness/No Action (Proposed Action)

The no wilderness/no action alternative would recommend the entirety of both WSAs nonsuitable for wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 29,035 acres (10,600 acres in the Hampton Butte WSA and 18,435 acres in the Cougar Well WSA) would be open to energy and mineral entry.

A high potential for oil and gas would initially be explored by seismic surveys. Surface disturbance from these surveys would be negligible. Further exploration is projected to involve drilling two test exploration wells (one in each WSA) which would require construction of drill pads, mud pits and 3 miles of access roads. Hydrocarbon reserves, most likely natural gas, would be expected to be discovered. Eight additional wells would be anticipated (three in Hampton Butte and five in Cougar Well) which would require 6 miles of access roads. Approximately 6 miles of pipeline would be constructed in the WSAs to market the gas. Total surface disturbance would be 35 acres in the WSAs. Due to a lack of known developable mineral resources and no mining claims within the WSAs, only casual surface exploration for these resources is projected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. The primary manner in which habitat is managed to support existing wildlife populations is through close coordination with the livestock grazing allotment management plan goals to ensure sufficient forage for wildlife and development of wildfire prescriptions which will return fire to its historic role in the ecosystem. Wildlife projects planned include prescribed burning and three water guzzlers (one in Hampton Butte and two in Cougar Well). Prescribed burning would be used together with wildfire to burn a total of 8,000 acres in this WSA complex (2,500 acres in Hampton Butte and 5,500 acres in Cougar Well). Any acreage burned by wildfire would replace, on an acre-by-acre basis, any acreage proposed to be burned by prescribed fire.

Watershed Management Actions

Juniper cutting and juniper riprap (streambank stabilization) of drainages would be used in both WSAs to control soil erosion and stabilize ephemeral stream channels. A total of 800 acres of juniper cutting (600 acres in Hampton Butte and 200 acres in Cougar Well) and 5 miles of juniper riprap (3 miles in Hampton Butte and 2 miles in Cougar Well) would be projected.

Livestock Management Actions

Two reservoirs and 1,500 acres of prescribed burning would be completed in the Hampton Butte WSA and 8 miles of pipeline and 5,920 acres of prescribed burning would be completed in the Cougar Well WSA. These projects would provide livestock water and forage to increase management flexibility and allow for more intensive grazing management. As a result, an additional 702 AUMs (300 AUMs in the Hampton Butte WSA and 402 AUMs in Cougar Well) would be allocated to livestock within ten years after complete project implementation.

Vehicle use would continue on the 24.3 miles of ways and 13.6 miles of road for the management of cattle and the maintenance of 6.8 miles of fence, five reservoirs and 4 miles of pipeline. The roads are used about 20 times per year and the ways 10 to 15 times per year to check livestock, spread salt and maintain facilities.

Recreation Management Actions

Vehicle use would continue on the existing 24.3 miles of ways and 13.6 miles of roads within the WSAs. Current recreation use is estimated to be 300 visitor days per year. Most of this current use utilizes vehicles for access to rockhounding and hunting areas.

Summary

Table 1 summarizes the projected management actions under each alternative.
Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Both WSAs generally appear in a natural condition and primarily affected by the forces of nature. Twenty-two unnatural interior features (12 in the Hampton Butte WSA and 10 in the Cougar Well WSA) influence approximately 21 percent of the Cougar Well WSA and 2 percent of the Hampton Butte WSA. The area of influence is an estimate of the acreage from which these features can be seen.

Unnatural features outside of the Hampton Butte WSA that affect its naturalness include boundary roads, a double wood pole powerline, vehicle traffic on Highway 20 (1 to 2 miles from the WSA), vehicle use on the road leading to Rhubarb Spring, several buildings and an airstrip in the town of Hampton (1.5 miles south of the WSA). Unnatural features outside of the Cougar Well WSA include vehicle traffic on Highway 20 (2 to 3 miles from the WSA), vehicle traffic on the G.I. ranch road (east of the WSA), vehicle traffic leading to an active water well on private land, a double woodpole powerline, a large crested wheatgrass seeding, several buildings in the town of Hampton (4 miles southwest of the WSA) and a power transmission line with a maintenance road extending along the WSA's southern boundary. These features generally have only a slight adverse effect on naturalness due to the topographic and vegetative screening available in the WSAs. However, naturalness in the southern portion of both WSAs is significantly reduced by these unnatural features.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The Hampton Butte WSA offers outstanding opportunities for solitude due to rugged topography and dense vegetative screening from juniper trees. However, these opportunities are limited to three areas: in a basin northeast of Rhubarb Spring, a small basin one mile north of Rhubarb Spring and a 2- to 3-mile-long canyon in the eastern part of the WSA. The area offering outstanding opportunities for solitude is limited by the narrow shape and limited size of the WSA, a private inholding in its center and the outside sights and sounds previously described. These factors limit opportunities for solitude, primarily in the southern half of the WSA.

Portions of the Cougar Well WSA offer outstanding opportunities for solitude due to the area's size, shape and topographic and vegetative screening. However, one private inholding and two tracts of split-estate land significantly restrict and reduce the quality of solitude on the surrounding public lands. Outside sights and sounds also reduce opportunities for solitude around the area's perimeter and within the southern portion of the WSA. For these reasons, secluded spots are limited to two small areas in the central and western portions of the WSA.

Hiking, camping, hunting, sightseeing, nature study, photography and horseback riding opportunities are available within the Hampton Butte WSA. However, they are less than outstanding because of the size and shape of the WSA, the limited vegetative diversity, lack of unique or challenging topographic features, and because of a road leading to a private inholding that confines movement through the WSA.

Opportunities for several types of primitive and unconfined recreational activities are also available within the Cougar Well WSA, including hiking, sightseeing, hunting, photography and horseback riding. However, the quality of these recreational opportunities is less than outstanding due to a limited amount of diversity in wildlife, topography and vegetation. There are no unique points of interest or physical challenges to attract visitors to this area. The private and split-estate inholdings also limit opportunities for unconfined movement through the WSA.

Special Features

A special feature of the Cougar Well WSA is crucial winter range habitat for antelope, located in the eastern portions of the area (see Map 2). Geological maps show some potential for paleontological resources in the eastern part of Hampton Butte WSA and in the southern and northwestern portions of Cougar Well WSA for Pleistocene mammalian fossils, as well as remains of birds and fish. No localities are known to be recorded for the areas. There are also special opportunities for cultural resource studies in both WSAs (see Cultural Resources section for further information.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey/Kuchler system of classifying ecosystems, both the Hampton Butte and Cougar Well WSAs are located in the Intermountain Sagebrush Province and have a potential natural vegetation of sagebrush steppe and sagebush steppe with juniper. The WSAs contain the following ecosystems listed in the High Lava Plains and Columbia Basin section of the Oregon Natural Heritage Plan: western juniper/big sagebrush/bluebunch wheatgrass, big sagebrush/bluebunch wheatgrass, and big sagebrush/Idaho fescue.

The WSAs are located within five hours' driving time of seven standard metropolitan statistical areas: Medford, Eugene/Springfield, Salem, and Portland, Oregon; Richland/Kennewick/Pasco and Yakima, Washington; and Boise, Idaho.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data supplemented by a limited amount of geochemical stream sediment sampling by geologists with TERRADATA, a consulting firm under contract with BLM. Technical details of the evaluation are found in a TERRADATA report titled "Assessment of Geology, Energy, and Minerals (GEM) Resources, Gerry Mountain Geologic Resource Area (GRA)". This report is supplemented by a BLM evaluation of the same area.

The Hampton Butte and Cougar Well WSAs are located within the Gerry Mountain geologic resource area, which has been classified according to a rating system that indicated both the potential for occurrence (level of potential) of certain minerals, as well as the quantity and quality of data on which the rating is based (level of certainty). A description of the rating system is provided in the Statewide EIS volume. Table 3 shows the energy and mineral potential classifications for the WSAs.

Both WSAs are within an area of critical mineral potential (ACMP) for oil and gas. The exposed rocks in the WSAs are Tertiary and Quaternary volcanics and volcaniclastic sediments. The subsurface rocks are inferred from oil and gas exploration wells to include Cretaceous marine clastic sediments and pre-Cretaceous marine sediments and metamorphosed sediments. Depth to these sediments varies from 1,500 to 2,500 feet.

Energy Resources

Oil and gas have a high potential for occurrence throughout both WSAs based on several positive factors. Two deep exploratory wells have been drilled near the WSAs. Both wells had oil and gas shows and these wells indicate that marine clastic sediments are probably present beneath the both WSAs. Other exploratory wells have been drilled in Central Oregon and all have had hydrocarbon shows and persistent exploration efforts all lead to a high potential rating for oil and gas in the WSAs.

As of October 16, 1987 there were no leases for oil and gas or geothermal resources in the WSAs.

Mineral Resources

There are no known mineral deposits within either WSA. As of October 16, 1987, there were no mining claims.

Vegetation

Vegetation in the Hampton Butte WSA is dominated by western juniper in association with varying amounts of low sagebrush and Idaho fescue. Most of the slopes and drainages exhibit some degree of western juniper dominance. The ridges between the drainages are dominated by low sagebrush and Idaho fescue and lack a significant juniper component. Similar vegetation extends east into the Cougar Well WSA until the topography grades down to the rolling to flat G.I. valley. At this point the vegetation changes to a generally continuous big sagebrush/Thurber's needlegrass/bluebunch wheatgrass community. The majority of the vegetation in both WSAs is in mid-seral ecological status. Threatened or endangered plants are not known to occur in the WSAs. One Federal candidate, *Rorippa columbiae,* is suspected of occurring adjacent to intermittent lakes within the Cougar Well WSA.

Wildlife

The WSA complex provides good yearlong habitat for approximately 70 mule deer, 60 antelope and 20 elk. An additional 30 mule deer and 240 antelope winter in the two areas with all crucial antelope winter range located in the Cougar Well WSA. In both WSAs, elk and antelope populations are increasing while mule deer are stable to slightly increasing. Golden eagles and redtail hawks nest and hunt in the study areas and Swainsons and ferruginous hawks probably occurred in the WSAs at one time, although no present use is documented. Upland gamebirds include mountain quail and sagegrouse (presently a Federal candidate species).

The majority of the WSA complex is in fair to good condition for wildlife. The habitat factors which most limit wildlife are a lack of water in approximately one-third of the WSAs and a lack of vegetative diversity as a result of historical control of wildfire. In addition, easy vehicular access to much of the Hampton Butte WSA results in frequent disturbance to wildlife populations.

Watershed

Intermittent streams flow during spring snowmelt, February to May, with most of the runoff going below ground into the G.I. Ranch Basin. The major intermittent drainages include the New Canyon and Long Hollow drainages which flow into the New Canyon reservoir and the G.I. Ranch Basin respectively. Several intermittent lakes are located within the WSAs. These small lakes contain less than two acre-feet of water and drain into pit-type reservoirs.

Upland watershed conditions in the WSAs are generally fair. Lack of wildfire has allowed a dominance by juniper and sagebrush which effectively represses cover of native bunchgrasses. As a result, snow melt and rain tends to run off the soil instead of soaking into it, causing erosion. This soil-laden runoff further compounds the problem by scouring the banks of the intermittent streams, causing bank instability and gully erosion.

Livestock Grazing

Portions of two allotments are in the Hampton Butte WSA and a portion of one allotment is in the Cougar Well WSA. All public lands in the WSAs are under permit for livestock grazing. Table 4 summarizes existing livestock use in AUMs.

Existing livestock developments in the Hampton Butte WSA include 3.3 miles of fence, 2 reservoirs and 0.9 mile of pipeline. The Cougar Well WSA has 3.5 miles of fence, 3 reservoirs and 3.1 miles of pipeline.

Livestock operators use motor vehicles on the roads approximately 20 times per year and on the ways 10 to 15 times per year to check livestock, spread salt and inspect/maintain facilities.

Cultural Resources

At least one prehistoric campsite, with evidence of obsidian tool manufacture, has been discovered in the Hampton Butte WSA. The Yreka-Canyon City Road, which runs through the eastern portion of the Hampton Butte WSA and is located on a portion of the boundary of the Cougar Well WSA, dates from the 1860s. It was a route used by miners leaving northern California and heading northeast for the new gold discoveries in eastern Oregon and Idaho. It is not known whether there is currently any evidence of this route on the ground. There is excellent potential for discovering additional cultural resource sites in both WSAs. Unauthorized collection, theft and vandalism are the greatest threats to cultural resources in the WSAs.

Recreation Use

Recreation use of both WSAs includes a low level of hiking, backpacking, horseback riding, sightseeing and photography. Hunting and rockhounding are the most significant activities and utilize vehicles on the existing roads and ways for access. Use of the Hampton Butte WSA is slightly greater than the Cougar Well WSA due to the more varied topography and scenery.

Overall recreation use in the WSAs is estimated to be approximately 300 visitor days per year and is currently increasing by two to five percent per year.

Local Personal Income

Livestock use at the current level of 2,206 AUMs and recreation use totaling 300 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $26,500 for livestock grazing and $3,600 related to recreation use of the WSA, for an overall total of $30,100. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

All Wilderness

Recommended suitable for wilderness:

- Hampton Butte WSA: 10,600 acres
- Cougar Well WSA: 18,435 acres

- Total for both WSAs: 29,035 acres

Recommended nonsuitable for wilderness:

- Hampton Butte WSA: 0 acres
- Cougar Well WSA: 0 acres

- Total for both WSAs: 0 acres

Impacts on Wilderness Values

Wilderness values within the entire 10,600 acres of the Hampton Butte WSA and entire 18,435 acres of the Cougar Well WSA would be protected by legislative mandate through wilderness designation. Wilderness values of naturalness, solitude and primitive, unconfined recreation would be preserved. Special features including crucial antelope winter range and cultural resource values would also be protected.

Naturalness

The naturalness of the area's rolling hills, shallow desert canyons, desert plateaus and other natural-appearing areas within both WSAs (approximately 77 percent of both WSAs is pristine, uninfluenced by any unnatural interior features) would be enhanced by prohibiting motorized vehicle use. Closure of 4.8 miles of ways within the Hampton Butte WSA and 19.5 miles of ways within the Cougar Well WSA, which directly impact 20 acres and usually influence approximately 3,500 acres (12 percent of the combined acres of both WSAs), would allow the ways to revegetate. Approximately 1 mile of way in the Hampton Butte WSA and 7 miles of ways in the Cougar Well WSA access reservoirs and pipelines and would receive periodic use every 10 to 15 years, subject to permit, to provide for maintenance by heavy equipment. Disturbance to naturalness would be very limited since such infrequent use would allow these ways to revegetate.

Prescribed burning of 1,000 acres in the Hampton Butte WSA and 3,000 acres in the Cougar Well WSA would be noticeable in the short term. However, these treatments would eventually improve naturalness through restoration of a fire-dependent ecosystem.

Solitude

Opportunities for solitude provided by the size of both WSAs, over 6 miles of desert ravines within the Hampton Butte WSA and limited vehicle access, would be further enhanced by eliminating motorized vehicle use on 4.8 miles of ways in the Hampton Butte WSA and 19.5 miles of ways in the Cougar Well WSA. Vehicle use would be limited to the boundary roads, one dead-end road in the Hampton Butte WSA and two dead-end roads in the Cougar Well WSA. This reduction in vehicle access would provide areas for visitors to hike into and experience solitude without disturbance from motorized vehicles within these two WSAs. However, outside sights and sounds would continue to reduce opportunities for solitude around the perimeters of the WSAs, most notably in the southern portions.

There would be a temporary disruption of opportunities for solitude during periodic maintenance activities associated with five reservoirs estimated to occur every 10 to 15 years.

Primitive and Unconfined Recreation

Closure of 4.8 miles of ways within the Hampton Butte WSA and 19.5 miles of ways within the Cougar Well WSA would increase opportunities for primitive and unconfined recreation activities such as hiking, camping, hunting, sightseeing, nature study, photography and horseback riding. The quality of these activities would be improved by removing vehicles and allowing the vehicle ways within both WSAs to revegetate. A more natural and primitive setting would be provided.

Special Features

Eliminating motorized vehicle use on a total of 24.3 miles of vehicle ways within both WSAs would reduce impacts to special features by minimizing disturbance to crucial winter habitat for antelope located in the eastern portions of the Cougar Well WSA, and by reducing vehicle access and possible vandalism to known and potential cultural resource sites.

Conclusion: Wilderness designation of the entire 10,600 acres within the Hampton Butte WSA and 18,435 acres within the Cougar Well WSA would protect and enhance existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close 27,915 acres within the WSAs to energy and mineral entry. The 1,120 acres of split-estate in the Cougar Well WSA would be open to energy and mineral exploration.

Energy Development

Surface-disturbing exploration and development of oil and gas in the WSAs would be prohibited on 27,915 acres. Projected development of two exploration wells and eight production wells would be precluded. Exploration could occur on the 1,120 acres of split-estate land, but development would not be expected.

Conclusion: Production from eight projected oil and gas wells would be foregone.

Mineral Development

Surface-disturbing exploration and development for any mineral is not projected due to lack of favorable geologic settings for mineral resources.

Conclusion: No impacts to metallic or industrial mineral production are expected.

Impacts on Vegetation

Since the proposed livestock projects and associated grazing allocation increase would not be allowed under the all wilderness alternative, based upon the potential impacts to wilderness values, only the area subjected to prescribed burning and subsequent natural succession would have an effect on vegetation. For 4,000 acres treated by prescribed fire, the ecological status would rapidly change from mid-seral to late seral stage and the residual ground cover would increase. For those areas unburned (approximately 25,000 acres), the ecological status would not change.

Once closed to vehicles, the 24.3 miles of ways totaling 20 acres, would begin to revegetate within approximately two growing seasons.

Conclusion: Seral status of 4,000 acres would change from mid-seral to late seral in the short term through prescribed burning. A total of 24.3 miles of ways (20 acres) would revegetate.

Impacts on Wildlife Habitat

Wildlife habitat quality would be maintained under this alternative through prescribed burning of 4,000 acres. Continued vehicle access on the boundary roads and use of private inholdings would continue to have negative impacts to wildlife in the Hampton Butte WSA due to the configuration of the WSA. Forage above the level necessary to meet ODFW goals for big game would be available since livestock projects would not be developed. Big game populations would not change.

Conclusion: Vehicle access would continue to have negative impacts on wildlife populations and prescribed burning would ensure wildlife habitat is maintained. Overall, wildlife habitat would not change.

Impacts on Watershed

Upland watershed stability would improve on 4,000 acres subjected to prescribed burning. While the burning would remove vegetative cover in the short term, a greater diversity of vegetation and a larger composition of soil-holding perennial grasses would be established in the long term, resulting in less soil movement from rain and snowmelt.

Conclusion: Upland watershed stability would improve on 4,000 acres.

Impacts on Livestock Grazing

Livestock use would remain at the present level of 775 AUMs in the Hampton Butte WSA and 1,431 AUMs in the Cougar Well WSA. A potential allocation increase of 702 AUMs (300 in Hampton Butte and 402 in Cougar Well) would be foregone since the projects necessary for this allocation would not be allowed.

Vehicle use for livestock management and facility inspection/maintenance on 24.3 miles of ways in both WSAs would be precluded, resulting in inconvenience and slight additional expense to the livestock operators. Mechanized heavy equipment would be used, subject to permit, once every 10 to 15 years to maintain five reservoirs and 4 miles of pipeline.

Conclusion: A potential increased allocation of 702 AUMs made available through project development would be foregone. Vehicle use of 24.3 miles of ways would be precluded with some inconvenience and additional expense to the livestock operator.

Impacts on Recreation

Vehicular access for hunting and rockhounding would be restricted through the closure of 24.3 miles of ways in the WSAs. Roads within and between the WSAs (totaling 13.6 miles) would remain open. Hunters would have a more difficult time scouting the areas by vehicle for game animals. The quality of hunting, hiking, backpacking, photography and sightseeing would increase since the area would appear more natural with less vehicle traffic.

There would be a moderate reduction in visitor use in both WSAs in the short term since much of the existing use is dependent on motorized vehicles. In the long term nonmotorized recreation would increase and generally offset any initial reduction in motorized use.

Conclusion: The amount of recreation use would not change. The type of use would change from predominantly motorized to nonmotorized forms of recreation. Use would continue to increase at an annual rate of two to five percent.

Impacts on Local Personal Income

Livestock grazing would remain at 2,206 AUMs. Overall recreation use would remain at 300 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be no net change from the current level.

Conclusion: Annual local personal income generated from resource outputs in the WSA would remain at approximately $30,100.

Enhanced Wilderness

Recommended Suitable for Wilderness:

- Hampton Butte WSA: 10,600 acres (10,920 assuming acquisition of 320 acres of private land).

- Cougar Well WSA: 18,435 acres (19,635 assuming acquisition of 1,200 acres of private inholdings).

- Total for both WSAs: 29,035 acres (30,555 assuming acquisition of 1,520 acres of private inholdings).

The two WSAs would be combined for a total of 29,035 acres. Assuming acquisition of 1,200 acres of private inholdings and acquisition of 320 acres between the WSAs, the total area recommended suitable for wilderness would be 30,555 acres.

Recommended nonsuitable for wilderness:

- Hampton Butte WSA: 0 acres
- Cougar Well WSA: 0 acres

- Total for both WSAs: 0 acres

Impacts on Wilderness Values

The Enhanced Wilderness Alternative would combine both WSAs and add 30,555 acres to the NWPS, assuming acquisition of 160 acres of private inholdings within the Hampton Butte WSA, 1,040 acres of private land in the Cougar Well WSA and 320 acres of private land between the WSAs. The mineral estate on 1,120 acres of split-estate lands would also be acquired. There would be 24.3 miles of ways closed to vehicle use as well as 13.6 miles of road (1.4 miles in Hampton Butte, 5.2 miles in Cougar Well and 7 miles between the WSAs). The Hampton Butte and Cougar Well WSAs would be designated wilderness and wilderness values in these two areas would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation and the special features would be preserved.

Acquisition of 1,120 acres of subsurface minerals estate and 1,520 acres of private land would prevent possible disturbance from mineral or energy exploration and development and also ensure the preservation of naturalness and opportunities for solitude and primitive recreation.

Naturalness

For the 30,555 acres recommended suitable for wilderness, the effects on naturalness would be similar to the all wilderness alternative except the enhanced alternative would include the acquisition of 1,520 acres of private land and 1,200 acres of mineral estate and the closure of 13.6 miles of road within and between the WSAs.

Closing 13.6 miles of road would allow revegetation of 16 acres and prevent their unnatural influence on approximately 1,929 acres. As in the all wilderness alternative, closing 24.3 miles of ways would allow revegetation of 20 acres and eliminate their unnatural influence on 3,500 acres.

Prescribed burning of 1,000 acres in the Hampton Butte WSA and 3,000 acres in the Cougar Well WSA would be apparent in the short term. However, these treatments would eventually improve naturalness through restoration of a fire-dependent ecosystem.

Solitude

The effects on solitude would be similar to the all wilderness alternative except for the additional enhancement of opportunities for solitude caused by the proposed road closures and land and mineral estate acquisitions. Projected short-term impacts to solitude opportunities from casual mineral exploration on the acquired lands would be precluded. Eliminating motorized vehicle use on 13.6 miles of roads and 24.3 miles of ways and precluding mineral entry and exploration on 1,520 acres of acquired private lands and 1,120 acres of acquired split-estate land would increase solitude opportunities by further increasing the size of the area where a wilderness visitor's solitude would not be disturbed by vehicle use within the WSAs. However, outside sights and sounds would still continue to reduce solitude opportunity around the perimeter of both WSAs, most notably in their southern portions.

There would be a temporary disruption of opportunities for solitude during periodic maintenance activities associated with five reservoirs. This is projected to occur every 10 to 15 years.

Primitive and Unconfined Recreation

The same increased opportunities for primitive and unconfined recreation as in the all wilderness alternative, resulting from the closure of 24.3 miles of ways, would occur. In addition, closure of 7 miles of boundary road between the WSAs and 6.6 miles of dead-end interior road to motorized vehicles and combining the two WSAs into one wilderness area would result in increased opportunities for primitive and unconfined recreation activities such as hiking, hunting, camping, sightseeing, nature study, photography and horseback riding.

The quality of these experiences would be improved by removing vehicles and allowing the vehicle access routes to revegetate. A more natural appearing area for primitive recreational activities would be provided. The acquisition of 1,120 acres on non-Federal mineral estate and 1,520 acres of private inholdings would prevent mineral entry and exploration, thus preserving a natural setting for primitive recreation pursuits.

Special Features

The impacts to crucial winter habitat for antelope in the eastern portion of the Cougar Well WSA and to cultural resources would be similar to the impacts identified in the all wilderness alternative. However, the acquisition of 1,120 acres of split-mineral estate and 1,520 acres of private land would preclude mineral entry and casual, nonsurface disturbing exploration, further preserving crucial winter habitat for these species. Vehicle access to cultural resource sites would be eliminated and potential vandalism reduced.

Conclusion: Wilderness designation of 30,555 acres would protect and enhance existing wilderness values. The acquisition of 1,120 acres of mineral estate and 1,520 acres of private land, along with closure of 13.6 miles of roads would further enhance the area by preserving wilderness values on all lands within the wilderness boundaries.

Impacts on Energy and Mineral Development

Wilderness designation would close 30,555 acres to energy and mineral entry, assuming acquisition of 1,520 acres of private land and 1,120 acres of split-estate land.

Energy Development

Surface-disturbing exploration and development of oil and gas would be precluded on 30,555 acres by wilderness designation. Projected development of eight production wells would be precluded.

Conclusion: Production from eight projected wells would be foregone.

Mineral Development

Surface-disturbing exploration and development for any mineral are not projected.

Conclusion: No impacts to metallic or industrial mineral production are expected.

Impacts on Vegetation

Since the proposed livestock projects and associated grazing allocation increase would not be allowed under the enhanced wilderness alternative (based upon the potential impacts to wilderness values), existing management, prescribed burning and natural succession would have the greatest effect on vegetation. For 4,000 acres treated by prescribed fire, the ecological status would rapidly change from mid-seral to late seral stage and the residual ground cover would increase. For those areas unburned (approximately 26,000 acres), the ecological status would not change.

Once closed to vehicles, the 24.3 miles of ways (totaling 20 acres) and the 13.6 miles of roads (totaling 16 acres) would begin to revegetate within two to three growing seasons, with the roads needing more time than the ways.

Conclusion: Seral status of 4,000 acres would change from mid-seral to late seral through prescribed burning. A total of 36 acres of roads and ways would begin to revegetate within two to three growing seasons.

Impacts on Wildlife

Wildlife habitat quality and diversity would be maintained by this alternative through prescribed burning of 4,000 acres. Closing 13.6 miles of road between and within the two WSAs, as well as the 24.3 miles of ways, and the acquisition of private inholdings and split-estate would improve wildlife habitat and assure habitat security. Forage above the level necessary to meet ODFW goals would be available since livestock projects would not be developed and no additional forage would be allocated to livestock. Big-game populations would increase by 10 percent in the long term.

Conclusion: Wildlife habitat would be improved by the closing of roads and ways and acquisition of inholdings. Habitat quality would be maintained by returning fire to its natural role. Overall wildlife habitat would be improved and big-game populations would increase by five percent in the long term, exceeding ODFW goals.

Impacts on Watershed

Upland watershed stability would improve on 4,000 acres subjected to prescribed burning. While the burning would remove vegetative cover in the short term, a greater diversity of vegetation and a larger composition of soil-holding perennial grasses would be established in the long term, resulting in less soil movement from rain and snowmelt.

Conclusion: Upland watershed stability would improve on 4,000 acres.

Impacts on Livestock Grazing

Livestock use would remain at the present level of 775 AUMs in the Hampton Butte WSA and 1,431 AUMs in the Cougar Well WSA. A potential allocation increase of 702 AUMs (300 in Hampton Butte and 402 in Cougar Well) would be foregone since the projects necessary for this allocation would not be allowed.

Vehicle use for livestock management and facility inspection/maintenance would be precluded on 24.3 miles of way and 13.6 miles of road, resulting in inconvenience and additional expense to the livestock operators. Mechanized heavy equipment would be used, subject to permit, once every 10 to 15 years to maintain five reservoirs and 4 miles of pipeline, and once every three to five years to maintain two spring developments and one well located on acquired private inholdings.

Conclusion: A potential increased allocation of 702 AUMs made available through project development would be foregone. Vehicle use of 24.3 miles of ways and 13.6 miles of road would be precluded with inconvenience and additional expense to the livestock operators.

Impacts on Recreation Uses

Vehicular access for hunting and rockhounding would be eliminated through the closure of 24.3 miles of ways and 13.6 miles of roads within and between the WSAs. Hunters and rockhounds would have a more difficult time engaging in their activities. The quality of hiking, backpacking, photography and sightseeing would significantly increase as motorized vehicles were totally eliminated from the areas, except for occasional maintenance of livestock developments. There would be a significant initial reduction in motorized visitor use of the WSAs upon wilderness designation. In the long term, nonmotorized recreation would increase and partially offset the decrease in motorized recreation.

Conclusion: The area's recreation use level of 300 visitor days per year, would be expected to decrease to 100 visitor days in the short term. In the long term, nonmotorized recreation would increase. Overall, the use level would be expected to decrease to 200 visitor days per year and then would continue to increase at an annual rate of approximately two to five percent.

Impacts on Local Personal Income

Livestock grazing would remain at 2,206 AUMs. Overall recreation use would decrease by 100 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net decrease of $1,200 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would decrease by approximately $1,200.

No Wilderness/No Action (Proposed Action)

Recommended suitable for wilderness:

Hampton Butte WSA: 0 acres
Cougar Well WSA: 0 acres

Recommended nonsuitable for wilderness:

Hampton Butte WSA: 10,600 acres
Cougar Well WSA: 18,435 acres

Impacts on Wilderness Values

Under this alternative, none of the 10,600 acres in the Hampton Butte WSA or 18,435 acres within the Cougar Well WSA would be designated wilderness and wilderness values would not receive special legislative protection.

Wilderness values of naturalness, solitude, primitive and unconfined recreation and the special features would be subject to the effects of projected management actions. Projected actions include: energy exploration and development of 10 oil and gas wells; 9 miles of access road and 6 miles of pipeline; construction of 3 wildlife guzzlers; 2 reservoirs and 8 miles of livestock water pipeline; an increase of 702 AUMs in authorized livestock use; 800 acres of juniper cutting, prescribed burning of 15,420 acres and juniper riprap along 5 miles of ephemeral drainage. Vehicle use would continue and would be limited to existing roads and ways for livestock management and recreation use.

Naturalness

Continued vehicle use on the 24.3 miles of ways, 6.6 miles of dead-end roads and 7 miles of boundary road between the WSAs would maintain the impact of vehicles upon naturalness on approximately 5,373 acres (18.5 percent of the combined acreage of both WSAs). Most of this influence upon the area's naturalness would occur on the boundary road between the two WSAs and in their southern portions. Short- and long-term impacts to naturalness would result from projected oil and gas activities including 10 wells, 9 miles of road and 6 miles of pipeline directly affecting 35 acres and visually influencing 4,970 acres, construction of 3 wildlife guzzlers directly affecting 2 acres and visually influencing 50 acres, construction of 2 livestock reservoirs directly affecting 4 acres and visually influencing 166 acres, and construction of 8 miles of livestock water pipeline directly affecting 8 acres and visually influencing 1,136 acres. The allocation of an additional 702 AUMs would increase trampling around water sources and increase the utilization of forage, resulting in a more grazed appearance with a reduced amount of residual ground cover.

Five miles of juniper riprap in eroding drainages would improve naturalness in the long term by helping to curb erosion and stabilize drainage channels. The 800 acres of juniper control and 15,420 acres of prescribed burning would be noticeable in the short term. However, in the long term these actions would lead to the restoration of a fire-dependent ecosystem with an increase in the natural components of grass and ground cover, resulting in less soil erosion.

Solitude

Human activity associated with projected energy development, livestock grazing projects, prescribed burning, other vegetative treatments and motorized vehicle use on 24.3 miles of ways and 13.6 miles of dead-end roads and boundary road would cause repeated local impairment of solitude opportunities adjacent to the actions. Vehicle use primarily occurs on the road between the WSAs and on the dead-end roads within both WSAs.

Opportunities for solitude would be restricted to small, unburned stands of juniper, primarily in the central and northern portions of the WSAs. Opportunities for solitude would no longer be available in juniper stands that are burned due to loss of vegetative screening.

Primitive and Unconfined Recreation

The projected activities and impacts described in the previous section (solitude) would also reduce primitive, nonmotorized recreation opportunities within and adjacent to the area of activity. The quality of these recreation opportunities would also be reduced. Prescribed burning of sagebrush and juniper, juniper cutting and gully riprap would improve opportunities for primitive and unconfined recreation associated with riparian and wildlife enhancement, such as hunting and photography in a generally natural setting.

Additional livestock resulting from increases in forage allocations, would increase vegetation removal, trampling, fecal deposits and fouling of water, especially in the areas of livestock concentration (i.e. around water, shade and on level ground) which are also the places where recreationists concentrate.

Special Features

Projected energy development, vegetation treatment activities and vehicle use would impact crucial winter range habitat for antelope, however no significant change in overall habitat condition or antelope populations would occur. Vehicle use would continue the potential disturbance to cultural resources.

Conclusion: In the absence of wilderness designation, projected management activities would directly and indirectly impair wilderness values on a long-term basis on up to approximately 12,000 acres (41 percent of the combined acreage of the WSAs) with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire Hampton Butte WSA (10,600 acres) and Cougar Well WSA (18,435 acres), totaling 29,035 acres, would be open to energy and mineral entry.

Energy Development

Oil and gas exploration and development would be allowed within the WSAs. Development of two exploratory wells and eight oil and gas production wells is projected.

Conclusion: Production from eight projected oil and gas wells would occur.

Mineral Development

Mineral entry would be allowed within the WSAs. Surface-disturbing exploration and development for any mineral are not projected.

Conclusion: No impacts to metallic or industrial mineral production are expected.

Impacts on Vegetation

Vegetation would be substantially altered by burning and juniper cutting on 16,220 acres. These treated areas would rapidly change from mid-seral stage to late seral stage. While utilization of key forage species would increase as a result of allocating 702 AUMs of additional livestock forage, an increase in herbaceous ground cover through burning and juniper cutting would result in an overall increase in residual ground cover in the WSAs.

Vegetation would also change as a result of energy development (35 acres), wildlife guzzler construction (2 acres) and livestock grazing developments (12 acres). These disturbances would generally eliminate vegetation from the immediate area.

The 24.3 miles of ways and 6.6 miles of dead-end interior roads would not revegetate due to continued vehicle use.

Conclusion: Residual ground cover would increase as a result of prescribed burning and juniper cutting and would be reduced through an increase in livestock utilization. A total of 16,220 acres would change from mid-seral stage to late seral stage as a result of vegetation treatment. Energy, wildlife and livestock developments would impact 49 acres.

Impacts on Wildlife

Wildlife would continue to be disturbed by motor vehicles in the WSAs, particularly in the Hampton Butte WSA. Projected energy development would disturb wildlife in the vicinity of the activity. Prescribed burning and juniper cutting would improve wildlife habitat by creating more habitat diversity. The continuous sagebrush community would be broken into many small islands of sagebrush habitat surrounded by late seral grassland. Livestock and wildlife water developments would increase the availability of water and would therefore increase the available summer habitat for all species of wildlife. ODFW management goals would be exceeded by this alternative and big-game populations would be expected to increase by approximately 10 percent, both summer and winter.

Conclusion: Wildlife habitat would be increased through additional water development and habitat diversity would be increased through prescribed burning and juniper cutting. Projected energy development and vehicle use would continue to disturb wildlife, including antelope, in the WSAs. Overall, wildlife habitat would improve and ODFW management goals would be exceeded.

Impacts on Watershed

Upland watershed stability would improve on 16,220 acres subjected to prescribed burning and juniper cutting. While the burning would remove vegetative cover in the short term, a greater diversity of vegetation and a larger composition of soil-holding perennial grasses would be established in the long term, resulting in less soil movement from rain and snowmelt. An increase in residual ground cover would offset a decrease expected through increased livestock forage utilization.

Erosion would stabilize on 5 miles of ephemeral drainages treated with juniper riprap. The trees, secured to the sides of the barren channels, would trap sediment and protect the banks from further erosion. Downstream water quality would improve.

Conclusion: Upland watershed stability would improve on 16,220 acres. Erosion would be reduced on 5 miles of ephemeral drainage.

Impacts on Livestock Grazing

An additional 702 AUMs would be allocated to livestock as a result of projected developments. In Hampton Butte WSA, construction of two reservoirs and prescribed burning of 1,500 acres would result in an additional allocation of 300 AUMs. In Cougar Well WSA, construction of 8 miles of water pipeline and prescribed burning of 5,920 acres would result in an additional allocation of 402 AUMs. Vehicle use for livestock management and facility inspection/ maintenance would continue on 24.3 miles of ways and 13.6 miles of dead-end interior and boundary roads between the WSAs.

Conclusion: An additional allocation of 702 AUMs would be realized.

Impacts on Recreation Use

Motorized recreation use would continue on 24.3 miles of ways and 13.6 miles of roads, including the 7 miles of road between the WSAs. Continued access for hunting and rockhounding would maintain the current levels of recreation use. Surface disturbance and disruption of wildlife from energy development and other projected management actions would slightly disturb the natural setting for primitive recreation activities such as hiking, backpacking, photography and sightseeing. However, the current use level of 300 visitor days per year for these activities would be expected to continue to increase at an annual rate of two to five percent.

Conclusion: The trend in recreation use which is currently estimated at 300 visitor days per year, would not be affected and would be expected to continue increasing at an annual rate of two to five percent.

Impacts on Local Personal Income

Livestock grazing would increase by 702 AUMs. Projected energy and mineral development would amount to eight oil and gas production wells. Overall recreation use would remain at 300 visitor days per year.

Table 5 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $8,400 per year plus an unknown level of increase attributable to the projected energy development.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $8,400.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (no wilderness/no action) wilderness values would be adversely affected by the projected development of eight oil and gas wells. Proposed management actions consisting of the development of 3 wildlife guzzlers, 2 reservoirs, 8 miles of livestock water pipeline and 16,220 acres of vegetation alteration would also adversely affect these wilderness values, although in the long term the vegetation alterations would result in a more natural appearing area. In the long term, vegetation would be disturbed on 49 acres.

Relationship Between Short Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, existing uses would continue and additional uses would occur. Short-term impacts to vegetation through juniper/sagebrush reduction on 16,220 acres and juniper riprap on ephemeral drainages would be offset by an increase in long-term productivity of renewable resources (livestock and wildlife forage and habitat, watershed values). The long-term productivity of nonrenewable resources (energy) would decrease as production depletes the existing resource. Wilderness values would also be lost on 49 acres resulting from surface disturbance from oil and gas development, as well as the construction of guzzlers, reservoirs and pipeline which would visually influence up to 12,000 acres on an overall basis. There would also be further declines in wilderness quality resulting from other uses over the long term.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action oil and gas reserves produced from eight oil and gas wells would be irreversibly and irretrievably committed. Wilderness values would be reduced on approximately 12,000 acres due to surface disturbance and visual influences from projected management activities.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Areas as Wilderness

While both the Hampton Butte and Cougar Well WSAs would be manageable as wilderness, there are several factors which detract from the overall manageability of the area under the all wilderness alternative. They include 6.6 miles of dead-end roads, parcels of private land totaling 1,200 acres and two parcels of split-estate lands totaling 1,120 acres.

The private inholdings are all used for livestock grazing and do not presently affect the manageability of either WSA. The landowners have not expressed interest in changing the use of this private land and it doesn't appear likely there will be a change in the future; however, land use could change at the discretion of the landowner. The split-estate lands reserve all minerals to the State of Oregon and could be developed at the State's discretion.

The enhanced wilderness alternative resolves the potential manageability problems through acquisition of non-Federal lands and minerals and through road closures.

Rationale for Selection of the Proposed Action

The no wilderness/no action alternative is the proposed action because of the limited number and range of wilderness values in the areas and the potential for resource uses which would be incompatible with wilderness preservation. The benefits of preserving the wilderness values would be outweighed by the benefits of retaining the option of developing resources, including oil and gas, which have a high potential for occurrence in the areas as well as increased levels of livestock grazing.

6. Summary and Analysis of Public Comments

The following is a summary of public comments and response to those comments specific to this WSA. They deal with the adequacy of the analysis in this appendix. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analyses are addressed in the Statewide volume.

Comment: The boundary, which cuts off 2,000 acres from the west, is not a road. **Response:** This boundary is a BLM-maintained pipeline road which has been in use for many years. It is on the District transportation map and has been and continues to be maintained periodically. It is used on a regular basis by ranchers and other members of the public.

Table 1. Summary of Proposed Management Under Each Alternative, Hampton Butte (OR-5-42) and Cougar Well (OR-5-43) WSAs.

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action (Proposed Action)
Acres designated as Wilderness	29,035	29,035	0
Acres Closed to ORVs by Wilderness Designation[1]	29,035	29,035	0
Mile of Roads Closed	0	13.6	0
Miles of Ways Closed	24.3	24.3	0
Acres of Full Fee Estate Acquired[2]	0	1,520	0
Acres of Mineral Estate Acquired[3]	0	1,120	0
Energy/Mineral Actions Acres withdrawn from location/leasing by Wilderness Designation	27,915	27,915	0
Roads Constructed (miles)	0	0	9
Oil and Gas Pipelines (miles)	0	0	6
Drill Sites (number)	0	0	10
Structural Wildlife Projects Developed			
Guzzlers (number)	0	0	3
Nonstructural Wildlife Projects Developed			
Brush Control w/o seeding (prescribed burning-acres)	4,000	4,000	8,000
Structural Livestock Projects Developed			
Reservoirs (number)	0	0	2
Pipeline (miles)	0	0	8
Nonstructural Livestock Projects Developed			
Brush control w/o seeding (prescribed burning-acres)	0	0	7,420
Additional Livestock Forage Allocation (AUMs)	0	0	702
Structural Watershed Projects Developed			
Riprap (miles)	0	0	5
Nonstructural Watershed Projects Developed			
Juniper Control (acres)	0	0	800

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[1] Except for 6.6 miles of dead-end interior roads, 7 miles of road between the WSAs and 24.3 miles of ways in the WSAs, most of the acreage shown is already closed to cross-country vehicle use through an existing designation which restricts ORV use to existing roads and trails.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] Upon acquisition of the mineral estate, these lands would be withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Hampton Butte (OR-5-42) and Cougar Well (OR-5-43) WSAs

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Proposed Action)
Wilderness Values	Wilderness designation of 10,600 acres of the Hampton Butte WSA and 18,435 acres of the Cougar Well WSA would protect and enhance existing wilderness values.	Wilderness designation of 10,760 acres of the Hampton Butte WSA and 19,475 acres of the Cougar Well WSA (both assuming acquisition of private inholdings), along with the acquisition of 320 acres between the WSAs and 1,120 acres of mineral estate and the closure of 13.6 miles of boundary and interior roads would protect and enhance existing wilderness values on 30,555 acres.	Projected management actions would impair the area's naturalness, solitude, primitive and unconfined recreation opportunities and special features on approximately 12,000 acres with further declines from other potential uses over the long term.
Energy and Mineral Development	Production from eight projected oil and gas wells would be foregone.	Production from eight projected oil and gas wells would be foregone.	Production from eight projected oil and gas wells would occur.
Vegetation	Seral status of 4,000 acres changed to late seral. 20 acres revegetated through closure of 24.3 miles of ways.	Seral status of 4,000 acres changed to late seral from mid-seral. 36 acres revegetated through closure of 24.3 miles of ways and 13.6 miles of roads.	Seral status of 16,220 acres changed to late seral from mid-seral Vegetation disturbed on 49 acres from projected management actions.
Wildlife	Wildlife habitat maintained. ODFW management objectives met.	Wildlife habitat improved. ODFW management goals exceeded. Big game increased by 5%.	Wildlife habitat improved. ODFW management goals exceeded. Big game increased by 10%.
Watershed	Upland watershed stability improved on 4,000 acres.	Upland watershed stability improved on 4,000 acres.	Upland watershed stability improved on 16,220 acres. Erosion reduced on five miles of ephemeral drainages.
Livestock Grazing	702 AUMs made available through project development foregone. Vehicle use of 24.3 miles of ways precluded with some inconvenience and additional expense to livestock operators.	702 AUMs made available through project development foregone. Vehicle use precluded on 24.3 miles of ways and 13.6 miles of road with inconvenience and additional expense to livestock operators.	702 AUMs made available through prescribed burning and water development would be realized.

Table 2. Summary of Environmental Consequences of Alternatives, Hampton Butte (OR-5-42) and Cougar Well (OR-5-43) WSAs

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Proposed Action)
Recreation Use	The recreation use level would not change or would decrease slightly. There would be a general change to primitive, nonmotorized types of recreation use.	The recreation use level would decrease to 100 visitor days per year. There would be a complete change to primitive, nonmotorized types of recreation use.	The recreation use level would not change.
Local Personal Income	Annual local personal income would remain at approximately $30,100.	Annual local personal income would decrease by approximately $1,200.	Annual local personal income would increase by approximately $8,400.

Table 3. Classification of Energy and Mineral Potential, Hampton Butte (OR-5-42) and Cougar Well (OR-5-43) WSAs

Commodity	Area	Level of Potential	Level of Certainty
Metals	All of both WSAs	L	B
Diatomite	All of both WSAs	L	C
Limestone	All of both WSAs	L	C
Zeolites	All of both WSAs	L	C
Bentonite	All of both WSAs	L	C
Uranium/Thorium	All of both WSAs	O	B
Geothermal	All of both WSAs	O	C
Oil/Gas	All of both WSAs	H	C
Sodium/Potassium	All of both WSAs	L	B
Coal	All of both WSAs	O	B
Tar Sands/Oil Shale	All of both WSAs	O	B
Sand and Gravel	All of both WSAs	L	C
Crushable Rock	All of both WSAs	L	C

Legend:

Level of Potential

O - No indication for accumulations of energy/mineral resource
L - Low potential for accumulations of energy/mineral resource
M - Moderate potential for accumulations of energy/mineral resource
H - High potential for accumulations of energy/mineral resource

Level of Certainty

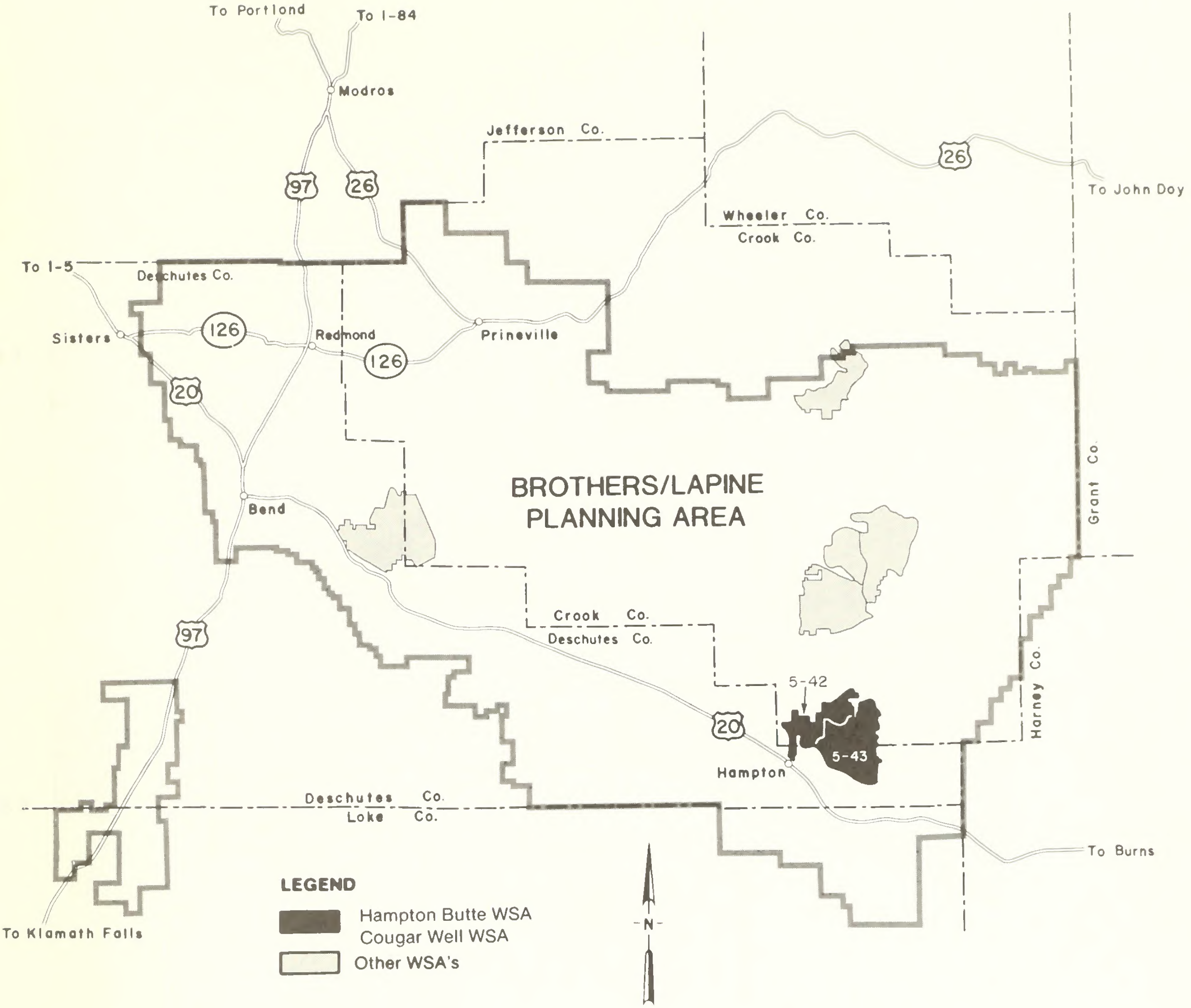
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

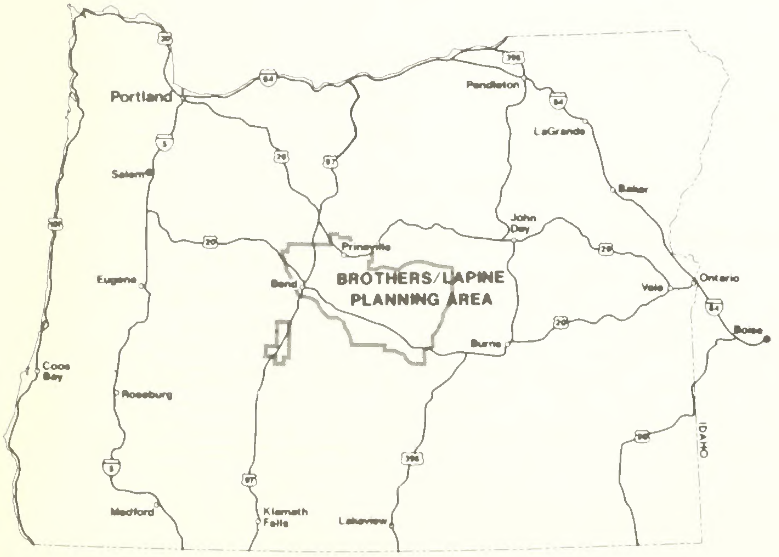
Table 4. Existing Livestock Use, Hampton Butte (OR-5-42) and Cougar Well (OR-5-43) WSAs.

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allotment in WSA	Current Estimated Use in WSA (AUMs)
Hampton Butte WSA				
G.I. (No. 0044)	11,166	3/1 - 2/28	6	634
Hampton (No. 003)	7,084	4/16 - 11/ 15	2	141
Total Hampton Butte	18,250			775
Cougar Well WSA				
G.I. (No. 0044)	11,166	3/1 -2/28	14	1,431
Total Cougar Well	11,166			1,431
Total both WSAs	29,416			2,206

Table 5. Effects of Alternatives on Local Personal Income, Hampton Butte and Cougar Well WSAs (OR-5-42 and 43) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action (Proposed Action)
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	No change	+702
Energy & Mineral Development:				
Oil & Gas Production Wells	Number	No change	No change	+8
Recreation Use	RVD	No change	-100	No change
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	No change	No change	+8,400
Energy & Mineral Development:				
Oil & Gas Production Wells	$	No change	No change	Unknown
Recreation Use	$	No change	-1,200	No change
Total	$	No change	-1,200	+8,400





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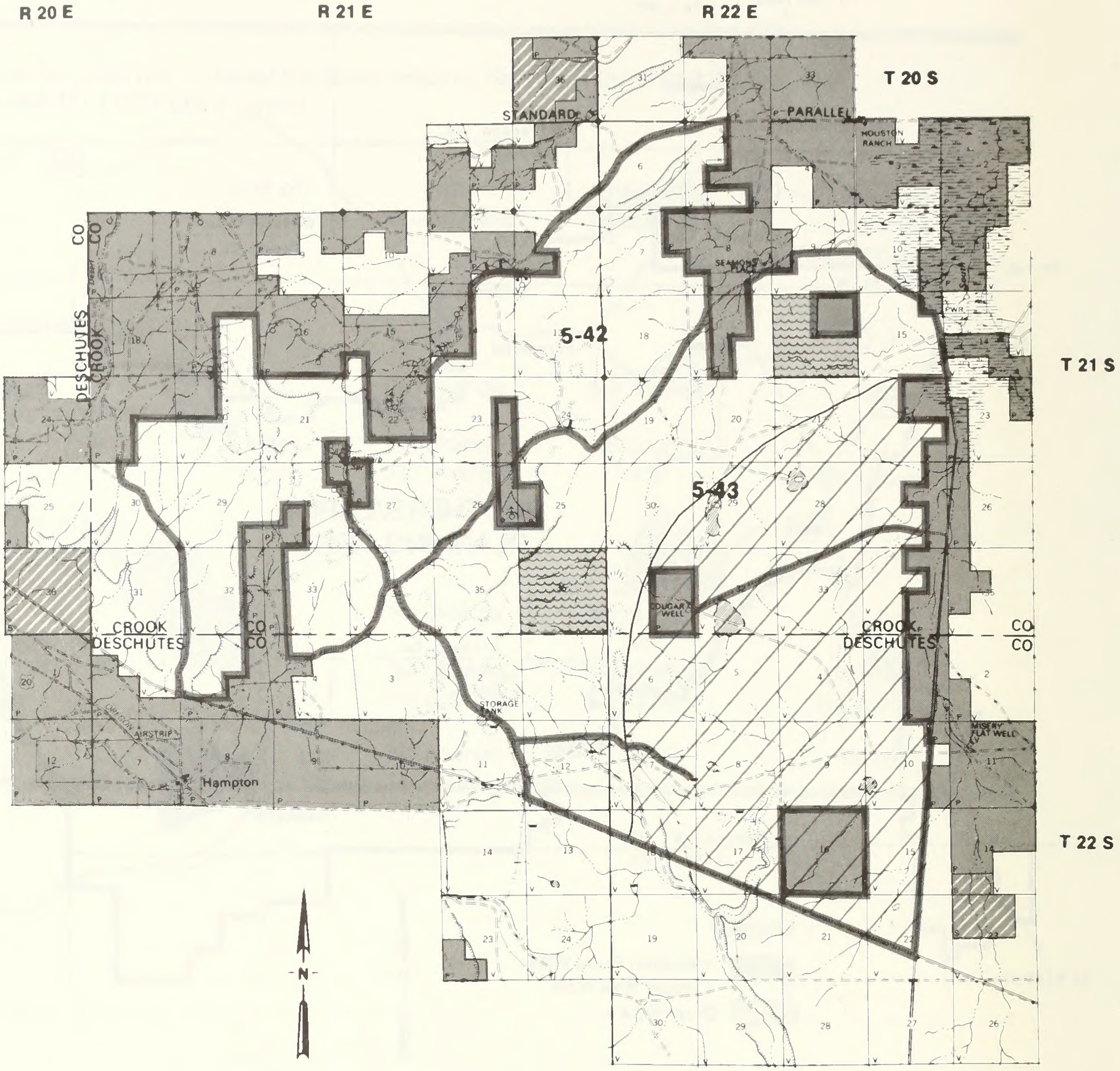
Prineville District
Hampton Butte WSA
OR-5-42 and
Cougar Well WSA
OR-5-43

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land Studied Under Section 202 of FLPMA (Other BLM Land in WSA Studied Under Section 603 of FLPMA)

━ **Wilderness Study Area Boundary**

– – **Boundary of Adjacent Wilderness Study Areas**

☐ **Bureau of Land Management**

▨ **State**

■ **Private**

▤ **BLM Surface–State or Private Subsurface (Split Estate)**

▧ **Crucial Antelope Winter Range**

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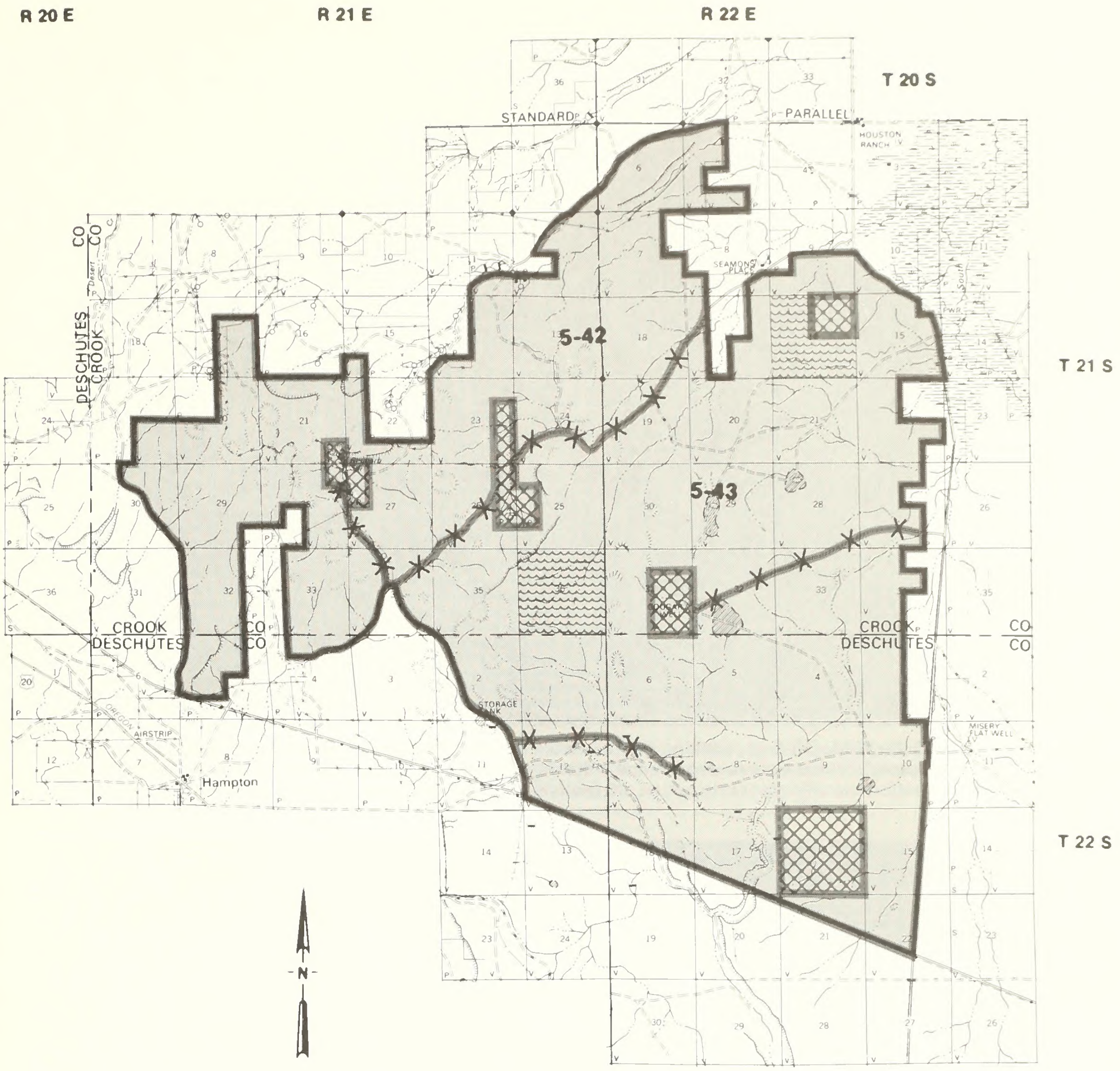
Prineville District

Hampton Butte WSA
OR-5-42 and
Cougar Well WSA
OR-5-43

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ **Wilderness Study Area Boundary**

▬ ▬ **Boundary of Adjacent Wilderness Study Areas**

☐ Recommended Suitable for Wilderness

▨ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

X—X Recommended Road Closure

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Prineville District

Hampton Butte WSA
OR-5-42 and
Cougar Well WSA
OR-5-43

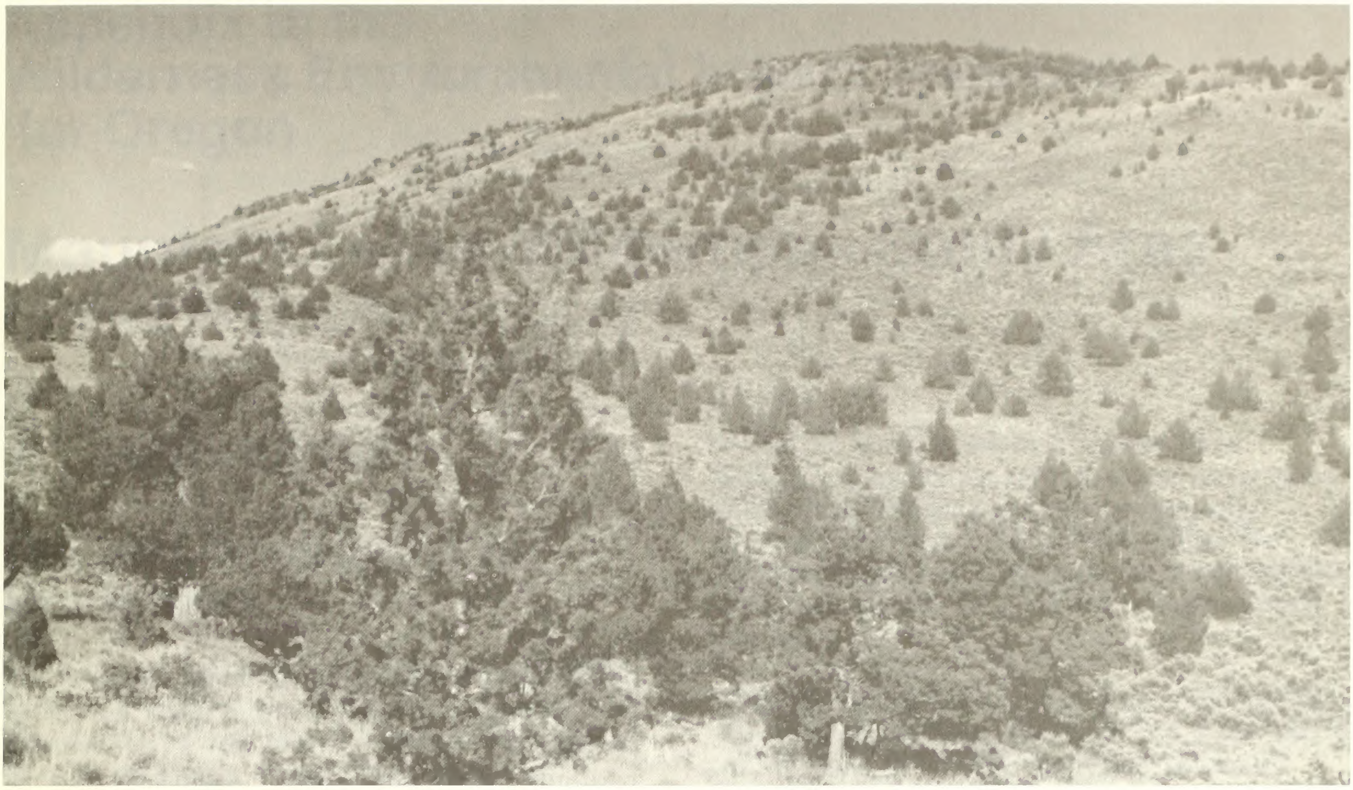
ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3

Hampton Butte WSA, OR-5-42. Looking north into the southern portion of the WSA (some of the land in the foreground is private property). Within area recommended suitable under the enhanced alternative and nonsuitable under the proposed action (no wilderness/no action alternative). Illustrates the topography in the southern part of the WSA. June 1979.

Cougar Well WSA, OR-5-43. Looking east into the eastern edge of the WSA (the background is not within the WSA). Within area recommended suitable under the enhanced alternative and within the area recommended nonsuitable under the proposed action (no wilderness/ no action) alternative. Typical view of the high desert from this part of the WSA. June 1979.



Cougar Well WSA, OR-5-43. Looking northeast toward the western half of the WSA. Within area recommended suitable under the enhanced alternative and nonsuitable under the proposed action (no wilderness/no action) alternative. Illustrates typical topography and scenery in the western half of the WSA.

Hampton Butte WSA, OR-5-42. Looking north at a typical vehicle way along the WSA's southern boundary. Within area recommended suitable under the enhanced alternative and nonsuitable under the proposed action (no wilderness/no action alternative). Typical example of juniper tree clusters in the WSA. June 1979.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Mountain Lakes Wilderness Study Area (OR-11-1)

1. Introduction

General Description of Study Area

The Mountain Lakes Wilderness Study Area (WSA) is located 15 miles northwest of Keno, Oregon, in Klamath County (see Map 1). Oregon State Highway 66 is approximately 13 miles south of the WSA boundary, and Oregon State Highway 140, approximately 3 miles northeast of the area. A local road, Aspen Road, is 0.5 mile from the eastern WSA boundary.

Having a rectangular shape, the WSA contains 334 acres, all of it public land (see Map 2). The Mountain Lakes Wilderness, administered by the U.S. Forest Service, forms the western boundary, while private lands surround the WSA on the north, east and south.

The study area lies on the steep, east slope of Aspen Butte. It ranges in elevation from 5,000 to 6,300 feet. Several streams dissect the WSA, with drainage to the east flowing into Aspen Lake. Vegetation is primarily sparse conifer stands and dense brushfields.

Interrelationships

Mountain Lakes WSA is adjacent to the east boundary of the Mountain Lakes Wilderness, managed by the Winema National Forest. Since the WSA lacks size and other wilderness characteristics on its own, it is being considered for wilderness only because of its relationship to the existing Mountain Lakes Wilderness under Section 202 of FLPMA.

The WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) Keno Wildlife Unit which contains approximately 972-square-miles of land area. The WSA supports summer populations of deer and elk. ODFW management goals include a ratio of 20 bucks per 100 does of black-tailed deer. No goals are set yet for elk as the herd is presently re-establishing itself in the area. The goal for nongame wildlife is to maintain populations of naturally-occurring species at self-sustaining levels. The proposed action for this WSA conforms with ODFW's management goals for game and nongame wildlife species.

The area could become part of a land exchange with Weyerhauser Company (WEYCO) that is intended to create more efficient land management patterns through consolidation of land holdings between BLM and WEYCO. The proposed action would eliminate the need for the exchange.

Klamath County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process.

These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impact on potential energy and mineral development,
- impact on wilderness values from adjacent private timberlands,
- impact on potential timber production,
- impact on the adjacent Mountain Lakes Wilderness,
- impact on potential land exchange with Weyerhaeuser Company (WEYCO),
- impact on deer, elk, bald eagle and other wildlife species and habitats,
- impact on recreation use levels.

The following topic was also considered but was not analyzed for this WSA because the environmental significance or concern was not major to the decision making process.

- impact on adjacent private land practices from potential redesignation of WSA to Class I airshed: As an addition to the adjacent Mountain Lakes Wilderness Area, which is already designated a Class I airshed, the Mountain Lakes WSA could be considered for redesignation to Class I. However, redesignation of this 334-acre addition to the adjoining 23,071-acre Class I area would have negligible effects on adjacent private land practices.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- All Wilderness (Proposed Action)
- No Wilderness/No Action

A partial wilderness alternative is not analyzed because of the area's small size. There is no opportunity for the area to be considered by itself, but only as an addition to the existing wilderness.

All Wilderness (Proposed Action)

Under the all wilderness alternative, all 334 acres of the WSA would be recommended suitable for wilderness as an addition to the existing Mountain Lakes Wilderness (see Map 2).

Energy and Mineral Development Actions

Wilderness designation would close all 334 acres within the WSA to mineral entry. Surface-disturbing exploration for geothermal resources and mineral materials (quarry rock) would be prohibited. There are no mining claims or mineral leases within the WSA.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and in a manner consistent with BLM's Wilderness Management Policy. Wildfire and natural succession are considered the primary wildlife habitat management techniques in the area. No wildlife projects are proposed.

Livestock Management Actions

No permitted grazing takes place in the WSA and the WSA is not part of any grazing allotment. No grazing allocations are expected and no livestock management projects are proposed.

Wood Products Harvest

Timber management actions would be precluded on all 334 acres within the WSA.

Recreation Management Actions

The entire 334 acres would be closed to motorized vehicle use. Presently, no vehicle use is evident anywhere in the WSA due to steep terrain, limited access, and brush and boulder fields that are impassable. Current recreational use is very minimal, estimated from field observations to be less than 100 visitor days per year. Most of the use is by hunters on foot.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 334 acres would be open to mineral entry. With respect to geothermal resources (which have a moderate potential for occurrence based on indirect evidence), water temperatures are not sufficient for electrical energy production and no nearby demand for hot water exists. Regarding mineral materials (quarry rock) which have a moderate potential for occurrence based on direct evidence, there are other nearby, more readily available sources. Therefore, no exploration or development is projected due to the abundance of other sources. There are no other mineral deposits and no mining claims in the WSA.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals. No wildlife projects are proposed.

Livestock Management Actions

No permitted grazing occurs in the WSA and the WSA is not part of any grazing allotment. No grazing allocations are expected and no livestock management projects are proposed.

Wood Products Harvest

Timber management actions on the 334 acres would include the harvest of an estimated 94 Mbf of timber annually and the construction of an estimated 2.5 miles of road to harvest and manage all 334 acres including planting, fertilizing, vegetation control, thinning, and site preparation. Over time, all 334 acres could be disturbed by timber management actions. Based on current methods used by WEYCO on adjacent land holdings, the potential land exchange would result in a rapid harvest of the commercial trees on the area. Four to five miles of road would be constructed.

Recreation Management Actions

The entire 334 acres would remain open to motorized vehicle use although steep terrain, brush and rocks make off-road travel almost impossible.

Current recreational use is minimal and estimated from field observations to be less than 100 visitor days per year. Most use is by hunters on foot.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA has a natural appearance. Steep slopes, limited access and brush and rocks have historically precluded timber management or other forms of disturbance.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Due to the small size of the area and the intense timber management activities on private lands on all but the west side of the WSA, opportunities for solitude and unconfined types of recreation can only be considered outstanding when the area is considered in conjunction with the existing Mountain Lakes Wilderness.

Vegetative screening within the WSA provides opportunities for solitude, and primitive recreation opportunities such as hunting or hiking would be available.

Special Features

The area offers potential habitat for nesting bald eagles.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Khchler system of classifying ecosystems, the Mountain Lakes WSA is located in the Pacific Forest Province, the same ecosystem as the Mountain Lakes Wilderness. The Mountain Lakes WSA contains one vegetative community listed in the Eastern Slopes, Oregon Cascades section of the Oregon Natural Heritage Plan. This is the mixed conifer forest (pine, Douglas fir and true fir).

There are three standard metropolitan statistical areas with populations over 100,000 within 5 hours' driving time of the area: Eugene/Springfield and Medford, Oregon; and Redding, California.

Energy and Mineral Development

Energy (oil, gas, geothermal) and mineral resources were evaluated from available BLM and United States Geological Survey (USGS) geologic data. The evaluation consisted of both field examinations and analysis of recently published USGS Conterminous United States Mineral Assessment Program (CUSMAP) data.

The WSA is within the Klamath-Butte Falls geologic resource area. Rocks and strata exposed at the surface in the study area are composed of Pliocene and Upper Miocene fine-grained, high alumina basaltic andesites (volcanic rock type). The rocks are exposed over large areas and generally thought to be derived from large, valley-filling flows and large, overlapping shield volcanoes. Pyroclastic (explosively ejected volcanic material) deposits are common throughout this unit.

Structurally, the rocks are probably bounded on the east by high-angle, normal faulting. Several lineaments (linear or line-like geologic features) are apparent on high-altitude photography. The rocks dip slightly to the east.

The WSA has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral classification for the WSA.

Energy Resources

Based upon indirect evidence, the entire WSA is considered to have a moderate potential for geothermal resources. Data analysis indicates known geothermal resources in the area, including a warm (94 degrees F) spring 6 miles northeast of the WSA, and the Klamath Falls Known Geothermal Resource Area 8 miles to the southeast.

As of October 16, 1987, there were no oil and gas or geothermal leases within the WSA.

Mineral Resources

Based upon direct evidence, the entire WSA is considered to have a moderate potential for the occurrence of mineral materials (quarry rock).

Field examination revealed no industrial minerals (sand, gravel, clay, stone, etc.) or solid leasable minerals (potassium, sodium, phosphate, sulphur and gilsonite). The WSA is rated as lacking favorability for these minerals.

Field examination and analysis of CUSMAP data indicates little or no favorability for the occurrence of locatable minerals. There are no known strategic or critical metals in or around the WSA.

As of October 16, 1987, there were no mining claims in the WSA.

Vegetation

Vegetation consists of a mosaic of mixed conifers in climax communities and dense brush fields. The conifer communities vary with elevation. Mixed white fir, Douglas fir, and ponderosa pine stands occur at elevations 5,200 to 5,600 feet. The timber type changes to mixed Shasta red fir and white fir at elevations 5,600 to 6,200 feet. The timber type mosaic is broken by dense brush patches of golden chinquapin and greenleaf manzanita. Pinemat manzanita is a ground cover in the Shasta red fir/ white fir timber types.

There are no known threatened or endangered plant species within the WSA.

Wildlife

Due to the elevation of the area, it is primarily summer range for the majority of the wildlife. Deer and elk use this area during summer, then migrate from the WSA during fall and winter. Other common wildlife species such as bear, coyote and quail may also use the area seasonally.

The use of the area by animals such as mountain lion, bobcat, martin or fisher is quite possible due to remoteness and habitat.

There is a good possibility that bald eagles, federally listed as Threatened in Oregon, may nest or roost in the WSA due to its topographic position overlooking Aspen Lake. Due to logging activities on adjacent private lands, the few remaining large trees available in the area for nesting and/or roosting are located in the Mountain Lakes Wilderness or the WSA.

Nongame wildlife associated with alpine or true fir vegetative zones is abundant in the area.

Watershed

The WSA lies within the Klamath Basin between 5,000 and 6,300 feet elevation on Aspen Butte. Its east-facing slopes are dissected by five minor drainages: a perennial drainage that rises from springs at the lower, eastern side of the WSA; an intermittent drainage to the north; and three poorly-defined drainages. Streamflows in the area are quite variable. Highest streamflows occur during winter and spring months from rainstorms augmented by snow melt. Water quality within the WSA is generally good.

Soils

The soils in the WSA and their characteristics which could be affected are described in Table 4.

Wood Products Harvest

The wilderness study area includes 334 public domain acres of commercial forest management lands recently classified for high intensity management. This acreage contains approximately 7.5 million board feet of standing timber volume, and could produce an average annual harvest of about 94,000 board feet (94 Mbf). Presently, this acreage is not part of either the BLM Medford or Lakeview District's allowable cut base.

The timber would be readily marketable as it is approximately 15 road miles from utilization centers in Klamath Falls, Oregon.

Recreation Use

Recreation use of the study area is minimal, consisting primarily of hunting and possibly hiking. Overall recreation use of the WSA is estimated to be less than 100 visitor days per year.

Local Personal Income

Recreation is the only resource output which generates economic activity in the WSA. Annual local personal income from recreation use is approximately $1,000. As of October 16, 1987, there were no oil and gas or geothermal leases on the WSA.

The standing timber, if harvested, would generate local personal income of $25,380 annually. However, this timber is not currently available for harvest under an approved land use plan. The term local personal income is discussed in the Statewide EIS volume.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed.

The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness (Proposed Action)

Recommended suitable for wilderness: 334 acres.
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness and added to the existing Mountain Lakes Wilderness. Wilderness values would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation are already protected in the existing wilderness. The addition would have the effect of breaking up the visual lines of forest management practices to the east of the existing wilderness boundary, and therefore, would help maintain the integrity of the existing Mountain Lakes Wilderness.

Naturalness

The naturalness of the area's undisturbed slopes would be maintained.

Solitude

Opportunities for solitude, which are shared with the existing wilderness, would be preserved, although some impairment would occur during logging operations on adjacent lands.

Primitive and Unconfined Recreation

Opportunities for primitive and unconfined recreation, such as hunting or hiking, which are shared with the existing wilderness, would be preserved.

Conclusion: Wilderness designation of 334 acres would protect wilderness values and add those acres to the existing Mountain Lakes Wilderness.

Impacts on Energy and Mineral Development

Wilderness designation would close all 334 acres to mineral entry.

Energy Development

Exploration for geothermal resources, which have a moderate potential for occurrence based on indirect evidence, would be precluded on 334 acres. Water temperatures are not sufficient for electrical energy production and no nearby demand for hot water exists.

Conclusion: There would be no impact to energy development.

Mineral Development

Exploration and development of quarry rock would be precluded on 334 acres. However, due to more readily available sources in the region, no exploration or development is projected in the WSA.

Conclusion: There would be no impact to mineral development.

Impacts on Vegetation

The vegetative composition as described in the vegetation section in the Affected Environment would not change except through natural processes.

Conclusion: No change would occur to vegetation in the area.

Impacts on Wildlife

Wildlife habitat for big game, upland game, furbearers and nongame species and their populations would be maintained under wilderness designation.

Conclusion: Habitat for game (including big game, upland game and furbearers), nongame species and their existing levels of populations would be maintained throughout the WSA.

Impacts on Watershed

There would be no change in the watershed. Due to slope and location, the existing Mountain Lakes Wilderness is the source for all water not originating within the WSA.

Conclusion: Water quality and stream conditions would be maintained.

Impacts on Soils

The existing situation of only natural processes occurring would continue.

Conclusion: There would be no impacts to soils.

Impacts on Wood Products Harvest

Commercial forest management would be precluded on 334 acres of public domain, high intensity timber lands, which contain approximately 7.5 million board feet (7.5 MMbf) of standing timber volume. Projected annual harvests of 94 Mbf would be foregone.

Conclusion: Projected annual harvests of 94 Mbf would be foregone.

Impacts on Recreation Use

Recreational use on foot and horseback would continue at existing levels. Vehicle use, which has not occurred, would be precluded by designation.

Conclusion: Recreation use would remain at less than 100 visitor days per year.

Impacts on Local Personal Income

Recreation use would remain at less than 100 visitor days per year, resulting in no change in local personal income from this activity.

Conclusion: Annual local personal income generated from resource activities in the WSA would remain at approximately $1,000.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 334 acres

Impacts on Wilderness Values

Under the no wilderness alternative, wilderness values on the entire 334 acres would not receive special legislative protection. Wilderness values of naturalness, solitude, and primitive and unconfined recreation would be subject to the effects of projected management actions.

Projected actions involve timber management activities either by the BLM or by the Weyerhaeuser Timber Company (WEYCO) if a land exchange is completed.

Naturalness

Projected timber management activities by either BLM or WEYCO would eliminate the naturalness of this relatively small area. Harvest of an estimated 94 Mbf of timber annually and the construction of an estimated 2.5 miles of road to harvest and manage all 334 acres including planting, fertilizing, vegetation control, thinning and site preparation would occur. Over time, all 334 acres would be disturbed by management actions and would be visible from approximately 300 acres within the existing Mountain Lakes Wilderness Area.

Solitude

Timber management activities by either BLM or WEYCO would impair the opportunities for solitude in this relatively small area.

Primitive and Unconfined Recreation

Timber management activities by either BLM or WEYCO would eliminate any opportunities for primitive and unconfined recreation in this relatively small area. Because of the bowl-like nature of the adjacent Mountain Lakes Wilderness Area, most visitor use occurs on the west side of Aspen Butte, so timber harvest in the WSA should not effect the experience of users of the adjacent wilderness. The WSA would, however, be visible from approximately 300 acres within the existing Mountain Lakes Wilderness Area.

Conclusion: In the absence of wilderness designation, projected management actions would impair the wilderness values of the entire 334 acres.

Impacts on Energy and Mineral Development

The entire 334-acre WSA would be open to mineral entry.

Energy Development

At most, only casual exploration for geothermal resources is expected. An extensive exploration/development program is not anticipated due to a lack of sufficient geologic evidence to support it. There are no geothermal leases in the entire WSA.

Conclusion: There would be no impact to energy development in the WSA.

Mineral Development

Sources for quarry rock exist in many nearby areas with much more favorable and accessible locations than those in the WSA. Therefore, no exploration/development actions for quarry rock are projected within the WSA.

Conclusion: There would be no impact on mineral development in the WSA.

Impacts on Vegetation

Without designation, all 334 acres would be subject to projected timber management activities. Timber harvest would not allow natural plant succession as the land would be reforested within 5 years of timber harvest. Vegetation would be changed from a mosaic of conifers and open brushfields to uniform stands of conifers within a 100-year period.

Conclusion: Intensive timber management practices would change the natural vegetation on all 334 acres.

Impacts on Wildlife

Timber production would involve construction of approximately 2.5 miles of road to allow access for harvest and regeneration activities based on current practices. Such road development would remove 7 to 10 acres of wildlife habitat. The new roads could result in harassment of wildlife which may cause changes in wildlife's use of the area.

The development of the timber resources would be periodic and varied so that the area would display a mosaic of stand conditions. This mosaic would be beneficial to some deer and elk by providing a variety of forage conditions. Wilderness-dependent species such as cougar, bobcat, and blackbear would be displaced to the adjacent wilderness area.

Special habitat features such as bear dens, eagle roosts and eagle nests would continue to be protected by standard forest management design features.

Based on current methods used by WEYCO on adjacent land holdings, the potential land exchange would result in a rapid harvest of the commercial trees on the area. Four to five miles of road would be constructed with impacts similar to those described above for road construction. This construction would remove 10 to 15 acres of wildlife habitat.

Conclusion: Wildlife populations of game (including deer, elk, and quail) and nongame species would sustain minor and temporary levels of harassment due to vehicle use on the projected roads and during harvest and reforestation activities. Changes in habitat by the development of the timber resources would improve forage conditions for deer and elk and result in displacement of wilderness-dependent species to the adjacent wilderness area.

Impacts on Watershed

Timber management activities would increase seasonal streamflow fluctuations (peaks and low flows) and reduce instream water quality (sedimentation, temperature, dissolved oxygen, nutrients and organic substances) in the main drainages dissecting the WSA. Impacts would be limited by the application of site-specific mitigating measures during harvest. Construction of up to 2.5 miles of new road would increase sedimentation in the drainages, especially during storm and snow melt runoff.

Increase in sedimentation due to logging would be short term returning to pre-logging levels within 5 years. Some sedimentation due to road runoff would persist indefinitely.

Under the potential WEYCO land exchange, sedimentation in drainages (on-site and downstream) would increase measurably over the levels resulting from BLM harvest practices. Increases in sedimentation from logging activity would return to pre-logging levels within 5 years. Some increase in sedimentation from the expected 4 to 5 miles of unsurfaced roads would persist indefinitely. WEYCO's forest management practices may not include buffers on drainages. The absence of buffers would increase temperature of the perennial stream and increase the magnitude and duration of the sedimentation of all drainages.

Conclusion: Water quality would be reduced and stream conditions altered by projected timber management activities of BLM or WEYCO.

Impacts on Soils

Timber harvest would result in a loss of soil productivity directly proportional to amounts of road construction, yarding system utilized, and methods of site preparation.

Under the potential WEYCO land exchange, there would be a similar loss in soil productivity from forest management practices. Land managed by WEYCO is expected to involve about 2 miles of additional road construction. These activities would measurably increase erosion and reduce soil productivity.

Conclusion: Soil productivity would be reduced in the area.

Impacts on Wood Products Harvest

Commercial forest management activities would occur on all 334 acres as this land is classified as high-intensity timber management land and would likely be included in the allowable cut base. The area contains approximately 7.5 million board feet of standing timber volume, and projected average annual harvest of about 94,000 board feet (94 MBF) would occur.

If the land were exchanged with WEYCO, the same overall timber harvest would occur.

Conclusion: Standing timber volume of 7.5 million board feet (7.5 MMbf) would be available for harvest. All 334 acres would be managed for commercial timber production and the projected annual harvest of 94 MBF would occur.

Impacts on Recreation Use

Motorized vehicle use of timber management roads, whether BLM or WEYCO, would increase hunter use of the area, based on use of roads in nearby areas. Opportunities for more primitive hunting opportunities on foot or horseback would be reduced due to ease of access. Overall recreation use of the WSA would be expected to increase from its current level of less than 100 visitor days per year to between 100 and 200 visitor days per year.

Conclusion: The area's overall level of recreation use would increase by as much as 100 visitor days per year.

Impacts on Local Personal Income

Timber harvest in the WSA would amount to 94 Mbf, generating a local personal income of $25,380 annually. Recreation use is expected to increase by as much as 100 visitor days per year, increasing the local personal income level by approximately $1,200 per year.

Conclusion: Annual personal income generated from resource activities in the WSA would increase by approximately $27,000.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (All Wilderness), projected annual harvest of 94 Mbf from 334 acres of commercial forest land would be foregone.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, existing short-term uses would continue. The long-term productivity of the wilderness values would be preserved on all 334 acres.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The area would be manageable as wilderness in conjunction with the adjacent Mountain Lakes Wilderness.

Rationale for Selection of the Proposed Action

The all wilderness alternative is preferred because the U.S. Forest Service, which is responsible for the management of the adjacent Mountain Lakes Wilderness, has stated support for designation of the WSA as an addition. The addition would help maintain the integrity of the existing wilderness and would benefit the visual character of some of the lands visible from the wilderness by reducing the contrast created by harvest practices occurring on adjacent private lands.

6. Summary and Analysis of Public Comments

The following public comment specific to this WSA, concerning adequacy of the analysis in this appendix, was received during the comment period on the 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning Statewide issues and analyses are addressed in the Statewide volume. Copies of all hearing transcripts and comment letters received on the Draft EIS and Supplement are on file for public review at the BLM Oregon State Office.

Comment: BLM did not consider the effects of Class I airshed designations on adjacent private land practices. **Response:** Action on the 344-acre potential addition to the 23,071-acre Mountain Lakes Wilderness would have negligible impacts with respect to airshed designations in the area.

Table 1. Summary of Proposed Management Under Each Alternative, Mountain Lakes WSA (OR-11-1)

Proposed Management	All Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	334	0
Acres Closed to ORVs by Wilderness Designation	334	0
Miles of Roads Constructed	0	2.5-4.5[1]
Average Annual Volume of Timber Harvested (Mbf-thousand board feet)	0	94
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	334	0
Acres Available for Wood Products Harvest	0	334

[1] Road construction totaling 2.5 miles would occur under BLM management, while 4.5 miles of road would be constructed under the potential WEYCO exchange.

Table 2. Summary of Environmental Consequences of Alternatives, Mountain Lakes WSA (OR-11-1)

Resource or Activity	All Wilderness (Proposed Action)	No Wilderness/ No Action
Wilderness Values	Wilderness designation of 334 acres would protect wilderness values and add those acres to the existing Mountain Lakes Wilderness.	In the absence of wilderness designation, projected management actions would impair the wilderness values of the entire 334 acres.
Energy and Mineral Development	There would be no impact to energy or mineral development since none is projected.	There would be no impact to energy and mineral development in the WSA.
Vegetation	No change would occur to vegetation in the area.	Intensive timber management practices would change the natural vegetation on all 334 acres.
Wildlife	Habitat for game (including big game, upland game and furbearers), non game species and their existing levels of populations would be maintained throughout the WSA.	Wildlife populations would sustain minor and temporary levels of harassment due to vehicle use on projected roads and during management activities. Changes in habitat would improve forage conditions for deer and elk and result in displacement of wilderness-dependent species to the adjacent wilderness area.
Watershed	Water quality and stream conditions would be maintained.	Water quality would be reduced and stream conditions altered by projected timber management activities of BLM or WEYCO.
Soils	There would be no impacts to soils.	Soil productivity would be reduced in the area.
Wood Products Harvest	Projected annual harvests of 94 Mbf would be foregone.	Standing timber volume of 7.5 million board feet would be available for harvest. All 334 acres would be managed for commercial timber production and the projected annual harvest of 94 Mbf would occur.
Recreation Use	Recreation use would remain at less than 100 visitor days per year.	The area's overall level of recreation use would increase to approximately 100-200 visitor days per year.
Local Personal Income	Local personal income would remain at approximately $1,000 annually.	Local personal income would increase by approximately $27,000 annually.

Table 3. Classification of Energy and Mineral Potential, Mountain Lakes WSA (OR-11-1)

Commodity	Area	Level of Potential	Level of Certainty
All Metals	Entire WSA	0	B
Industrial Minerals (Incl. Solid, Leasable Minerals)	Entire WSA	0	D
Mineral Materials (Quarry Rock)	Entire WSA	M	C
Geothermal Resources	Entire WSA	M	B
Oil/Gas	Entire WSA	L	C

Legend:

Level of Potential

O - No indication of accumulations of energy/mineral resource.
L - Low potential for accumulations of energy/mineral resource.
M - Moderate potential for accumulations of energy/mineral resource.
H - High potential for accumulations of energy/mineral resource.

Level of Certainty

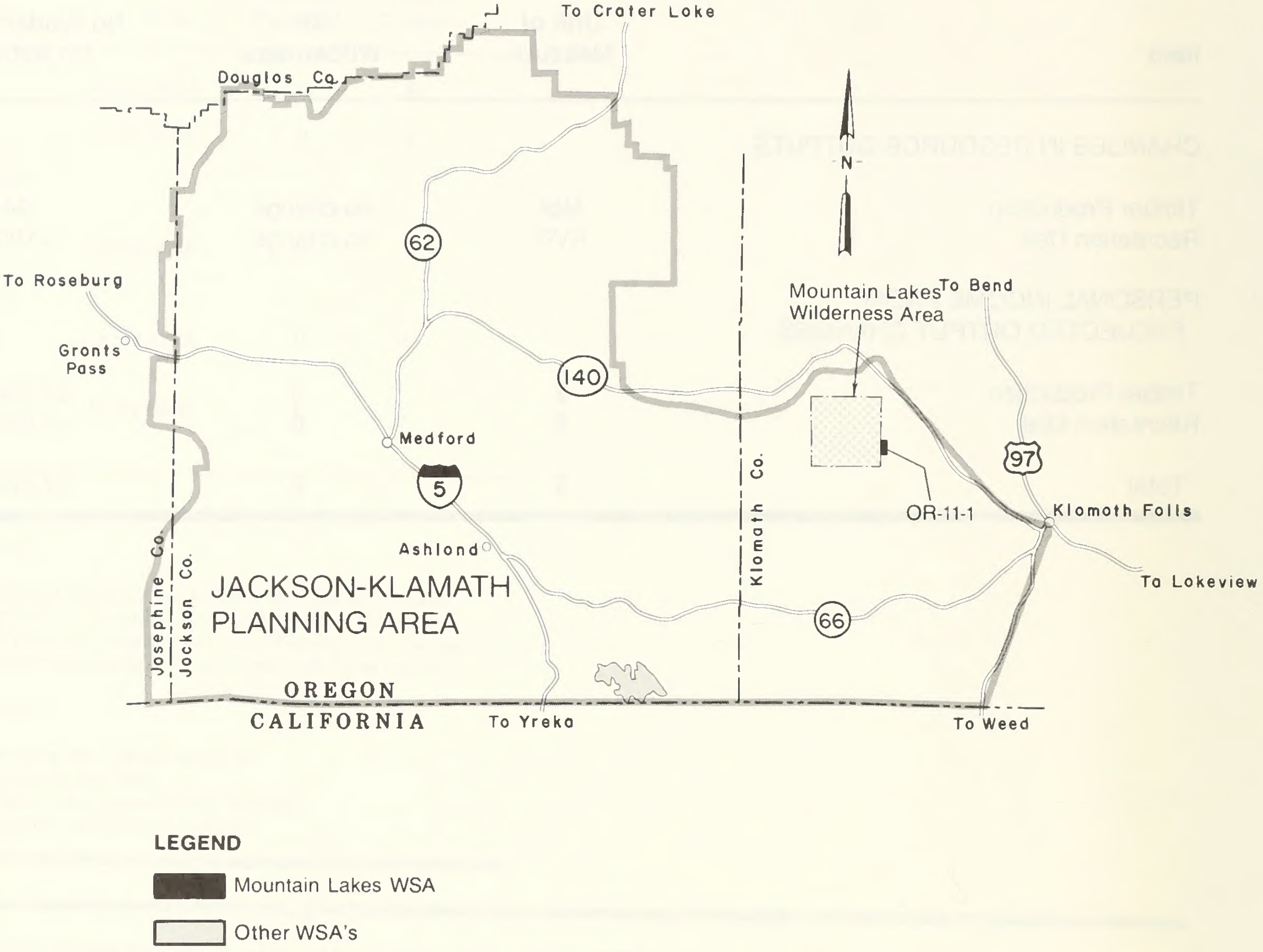
A - Insufficient data or no direct evidence
B - Indirect evidence available
C - Direct evidence but quantitatively minimal
D - Abundant direct and indirect evidence

Table 4. Soil Characteristics of the Mountain Lakes WSA (OR-11-1)

	Depth	Erodibility	Slope Stability	Compaction Hazard	Other
Woodcock Stony loam (815)	40-60"	Low	Stable	Moderate-high rock content makes compaction difficult to ameliorate by ripping.	Weak clay layer; high rock content (35-55%)
Oatman	20-40"	Low	Stable	Moderate-high rock content makes compaction difficult to ameliorate by ripping.	Very low clay content; high rock content (35-60%), above average ash content.

Table 5. Effects of Alternatives on Local Personal Income, Mountain Lakes WSA (OR-11-1) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Timber Production	Mbf	no change	94
Recreation Use	RVD	no change	+100
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES			
Timber Production	$	0	26,000
Recreation Use	$	0	+1,000
Total	$	0	27,000



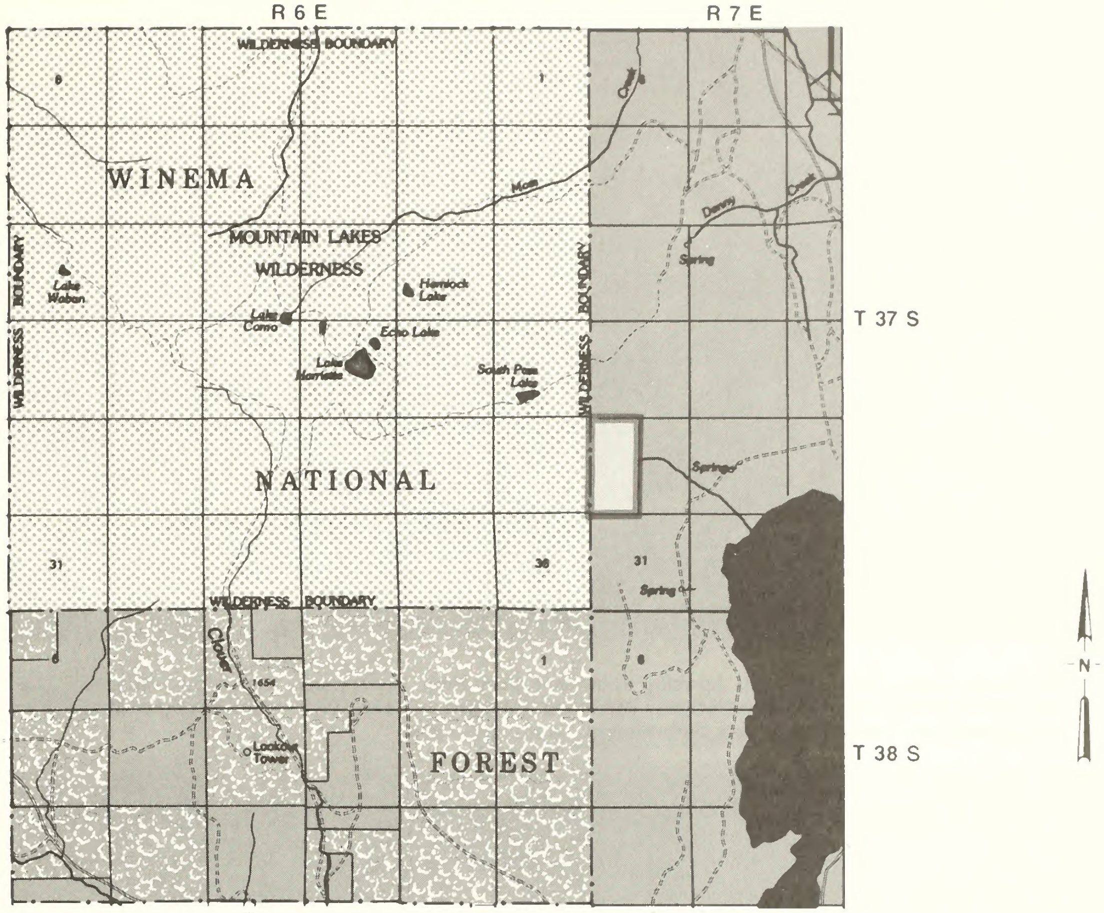
U.S. Department of the Interior
Bureau of Land Management
Lakeview District

Mountain Lakes WSA
OR-11-1

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▭ BLM Land Studied Under Section 202 of FLPMA
- ▬ Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ■ Private
- ▨ U.S. Forest Service
- ⬚ Existing USFS Wilderness Area

U.S. Department of the Interior
Bureau of Land Management

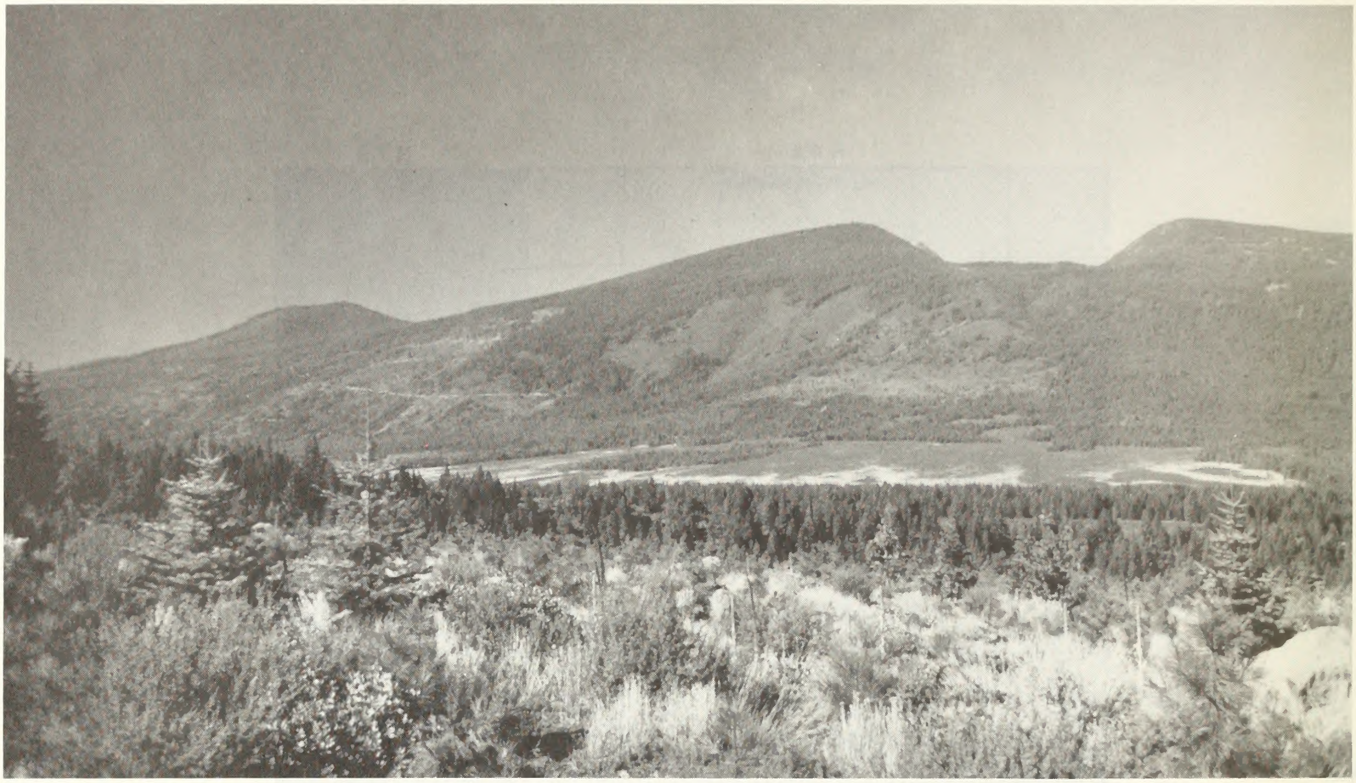
Lakeview District

Mountain Lakes WSA
OR-11-1

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



Mountain Lakes WSA, OR-11-1. Looking southwest from Hwy. 140 towards Aspen Butte (center). The WSA is located mid-slope in an area of brush and trees. The existing Mountain Lakes Wilderness is adjacent to the west; remaining boundaries are formed by private timberlands. September 1986.

Mountain Lakes WSA, OR-11-1. Vegetation on the eastern slope of Aspen Butte, as seen from adjacent private timberlands, September 1986.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Soda Mountain Wilderness Study Area (OR-11-17)

1. Introduction

General Description of Study Area

The Soda Mountain Wilderness Study Area (WSA) is located 18 miles southeast of Ashland, Oregon, in Jackson County (see Map 1). Medford, Oregon, the county seat, is approximately 30 miles northwest of the study area. Oregon State Highway 66 is approximately 4 miles north of the WSA boundary, and Interstate 5 lies approximately 6 miles west of the area. The California border passes very close to the WSA.

The WSA, which has an irregular shape, contains 5,640 acres, all of it public land (see Map 2). About half of this WSA is public domain lands; the remainder is O&C lands, most of which were classified as non-timber or low intensity timberlands under the Timber Production Capability Classification (TPCC) for the current 10-year timber management plan. The TPCC has recently been updated and 583 acres of O&C timberlands have tentatively been reclassified as suitable commercial forests. While under the current timber management plan these lands are not allocated to timber production, all suitable forest land could be considered for allocation to timber production or 312 acres of suitable land could be allocated to spotted owl habitat.

The area is bounded on the south, west, and northwest by low standard dirt roads, and on the east by a powerline. The northern boundary is on the flanks of Soda Mountain, and the western boundary is along Lone Pine Ridge. Adjacent lands are a mixture of private and public lands.

The study area lies on the steep, south-facing slopes of the Soda Mountain area. It contains ridges and peaks varying in elevation from 2,800 to 5,700 feet. Camp Creek, Dutch Oven Creek and Salt Creek dissect the WSA. Vegetation is varied, with stands of mixed conifers and hardwoods; extensive dense brushfields; and some open, grassy slopes.

Interrelationships

There are no notable interrelationships between this WSA and other WSAs. The Pacific Crest National Scenic Trail (PCT), which is closed to mechanized vehicles, passes through the northwest corner of the WSA above the headwaters of Dutch Oven Creek.

The California Department of Fish and Game's 3,150-acre Horseshoe Ranch lies just across the Oregon/California border to the south and extends to within 0.25 miles of the WSA. This ranch was purchased by the State of California to protect deer winter range.

The WSA is located within the Oregon Department of Fish and Wildlife's (ODFW) Rogue Wildlife Unit which contains 518 square miles of land. ODFW management goals include a ratio of 15 bucks per 100 does of black-tailed deer and 7 bulls per 100 cows of Roosevelt elk. ODFW and the California Department of Fish and Game (CDFG) have introduced populations of wild turkeys and red-legged partridges in similar habitats bordering the WSA in hopes of establishing huntable populations of these game species. The goal for nongame wildlife is to maintain populations of naturally-occurring species at self-sustaining levels.

The WSA also contains approximately 1,000 acres of a 2,200-acre Spotted Owl Management Area (SOMA). This SOMA was established under an ODFW/BLM cooperative agreement entitled, "BLM-ODFW Agreement for Spotted Owl Management on BLM Lands in Western Oregon," to protect spotted owl habitat. The northern spotted owl is proposed for listing as a Federal Threatened Species and is a State of Oregon Threatened Species. This agreement will protect the SOMA through at least October

1990 by reserving suitable habitat (up to 2,200 acres within a 2.1 mile radius of the center of activity), at which time it will be re-evaluated through the District's Resource Management Planning process.

The proposed action for this WSA conforms with ODFW's and CDFG's management goals for game and nongame wildlife species.

Jackson County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- impacts on wilderness values;
- impact on adjacent private lands (the effects of wilderness designation on private lands are addressed in the Statewide EIS Volume);
- impacts on livestock grazing use levels and management;
- impacts on timber production;
- impacts on energy and mineral development;
- impacts on recreation use levels;
- impacts on ecological diversity;
- impacts on wildlife; and
- impact of potential reclassification of WSA to Class I Airshed. (Wilderness areas less than 10,000 acres in size are not considered for Class I airshed redesignation in accordance with the Clean Air Act and Oregon Administrative Rules. Therefore, Soda Mountain, being 5,640 acres in size, would not be considered for Class I airshed designation.)

No other issues specific to this WSA were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness (proposed action)
- partial
- no wilderness/no action

An enhanced wilderness alternative is not analyzed. This alternative is analyzed where there is an opportunity to enhance wilderness manageability for a WSA, through such means as closure of dead-end roads, acquisition of inholdings, merging with adjacent study areas by closing boundary roads and, in a few cases, adding areas of land outside study areas. In WSAs with areas of substantial potential management problems, this alternative may propose excluding the problem areas as a means of enhancing wilderness values in the remaining area.

Many public comments suggested consideration of an enhanced wilderness alternative that would expand the WSA to include 32,000 acres of public and private lands. This alternative is beyond the scope of this EIS, which analyzes wilderness and non-wilderness recommendations for areas meeting the wilderness inventory criteria. See Chapter 5 of the Statewide Volume under Formulation of Alternatives for a more thorough discussion of rationale for not analyzing this and similar alternatives.

All Wilderness (Proposed Action)

Under the all wilderness alternative, all 5,640 acres of public land would be recommended suitable as wilderness (see Map 2).

Energy and Mineral Development Actions

Wilderness designation would close all 5,640 acres within the WSA to mineral entry. Surface-disturbing exploration for oil and gas, lead, molybdenum, copper, gold, mercury and silver would be prohibited. There are no mining claims or oil and gas leases within the WSA.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW management goals and in a manner consistent with BLM's wilderness management policy. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain at the current use levels of 517 AUMs in even-numbered years and 117 AUMs in odd-numbered years within the Soda Mountain Allotment. The season of use would remain as identified in Table 5 for the allotment. The limited existing vehicle use for livestock management on the 2-mile way would be precluded. Management of livestock and maintenance of 3.5 miles of fence would be conducted on horseback. No livestock management projects are proposed.

Wood Products Harvest

Timber management actions would be precluded on 5,640 acres including 923 acres of potentially suitable commercial forest land (583 acres of tentatively reclassified O&C land and 340 acres of public domain land) within the WSA. Timber harvest is currently precluded on 652 acres of these commercial forest lands in accordance with the Spotted Owl Management Plan.

Recreation Management Actions

The entire 5,640 acres would be closed to motorized vehicle use. Presently, vehicle use is limited by vehicle designation to the 2 miles of existing ways. Current recreational use is estimated to be between 8,000-9,000 visitor days per year. Most of this current use is by foot or horseback along the Pacific Crest Trail.

Partial

Under the partial alternative, 5,057 acres of public land would be recommended suitable as wilderness (see Map 3). The 583 acres of O&C timberlands on the north and west edges of the WSA would be recommended nonsuitable for wilderness.

Energy and Mineral Development Actions

Wilderness designation would close 5,057 acres within the WSA to mineral entry. Surface-disturbing exploration for oil and gas, lead, molybdenum, copper, gold, mercury and silver would be prohibited.

The 583 acres recommended as nonsuitable would be open to mineral entry. With no mining claims or oil and gas leases existing in the WSA, and no direct evidence of mineral or energy resources, no development is projected in this area. Because of difficult access and abundance elsewhere, no development of aggregates is projected.

Wildlife Habitat Management Actions

Habitat in the suitable portion would be managed to support existing wildlife populations as described in the all wilderness alternative and in the nonsuitable portion, would be managed to support ODFW goals by ensuring sufficient forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Livestock use would remain as described in the all wilderness alternative and Table 5. The limited existing vehicle use for livestock management on the 2-mile way would be precluded. Management of livestock and maintenance of 3.5 miles of fence would be conducted mainly on horseback. No livestock management projects are proposed.

Recreation Management Actions

The 5,057 acres recommended suitable under this alternative would be closed to motorized vehicle use including the 2-mile way.

The present ORV designation limiting motorized vehicles to the existing 2-mile way would be maintained. Currently, overall recreational use of the WSA amounts to approximately 8,000-9,000 visitor days per year.

Wood Products Harvest

Timber harvest would be precluded on 340 acres of commercial public domain timberlands in the suitable area.

Timber management actions could be allowed on 271 acres of the 583 acres of commercial O&C timberlands recommended as nonsuitable for wilderness. The remaining 312 acres of commercial O&C timberlands and 340 acres of public domain timberlands within the WSA would be reserved for the SOMA due to difficult access, low timber volumes and wildlife biologist's recommendations to continue the SOMA designation.

Timber management actions on the 271 acres could include the harvest of an estimated 60.4 Mbf of timber annually, the construction, over time, of an estimated 3 miles of roads to harvest and manage all 271 acres, including planting, fertilizing, vegetation control, thinning and site preparation. Over time, all 271 acres could be disturbed by management actions and would be visible from approximately 400 acres within the suitable portion of the WSA.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 5,640 acres would be open to mineral entry. With respect to oil and gas resources the WSA has no known petroleum bearing formations. Regarding lead, mercury, silver, molybdenum, copper and gold, there is a lack of direct evidence indicating favorability and there are no known mineral deposits and no mining claims in the WSA. Therefore, due to the lack of sufficient geologic evidence to justify a major exploration/development program, only casual surface exploration of these energy and mineral resources is postulated. Because of difficult access and abundance elsewhere, no development of aggregates is projected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with ODFW goals by ensuring sufficient forage for wildlife. No wildlife projects are proposed.

Livestock Management Actions

Current livestock grazing use would continue in the WSA as described in the all wilderness alternative.

No livestock forage increases are expected and no projects are proposed. Vehicles could be used for livestock management on the 2 miles of existing way; however, horses are used for all management activities at present.

Wood Products Harvest

Timber management actions would be allowed on 271 acres of the 923 acres of potentially suitable commercial timberlands (O&C and public domain lands) within the WSA. The remaining 652 acres of commercial timberlands would be reserved for the SOMA due to difficult access, low timber volumes and wildlife biologist's recommendations to continue the SOMA designation.

Timber management actions on the 271 acres could include the harvest of an estimated 60.4 Mbf of timber annually, the construction, over time, of an estimated 3 miles of roads to harvest and manage all 271 acres, including planting, fertilizing, vegetation control, thinning and site preparation. Over time, all 271 acres could be disturbed by management actions and would be visible from approximately 400 acres within the suitable portion of the WSA.

Recreation Management Actions

The present ORV designation limiting motorized vehicles to the 2 miles of existing way would be maintained. Currently, overall recreational use of the WSA amounts to approximately 8,000-9,000 visitor days per year.

Summary

Table 1 summarizes the projected management actions under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Soda Mountain WSA generally has a natural appearance. The steep terrain, dense brushfields, limited stands of commercial timber and difficult access of the WSA have all contributed to keeping the area in an essentially natural state.

Unnatural features within the WSA include 3.5 miles of drift fence near the eastern boundary, a well-used campsite on Camp Creek and 2 miles of way. The way extends from the powerline on the eastern boundary through the southeast portion of the WSA to the Schohiem road.

The drift fence is visible from a small area within the study area. The campsite on Camp Creek is concealed by surrounding trees and is visible only from within the camp area itself. The way does not create an impact on much of the area. These developments can be seen from only a very small percentage of the WSA.

Outside influences visible from within the WSA include timber harvest activities on adjacent lands, farming activities and hydropower developments in nearby valleys to the south, the powerline on the eastern border and a few residences in the Agate flat area on the southeast edge of the WSA. These sights are visible from a few portions of the WSA and, as perceived by the average visitor, would not detract from the wilderness experience. Since most visitor use would occur in the creek drainages, the outside developments would not be visible in most cases.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The steep terrain, three creek drainages, and dense vegetation provide opportunities for solitude within the WSA. Vegetative and topographic screening combine to provide secluded locations throughout the area.

The study area provides outstanding opportunities for hiking, camping, horseback riding and hunting.

The Pacific Crest National Scenic Trail traverses the northwestern portion of the WSA. There is botanical diversity and opportunities for observing birds and other animals. Scenic vistas are numerous. The three stream drainages are interesting and challenging for short backpacking trips. There are some opportunities for fishing, though this activity would be limited by small stream size and seasonal flow. The variety of species present within the WSA and the geologic diversity of the area contribute to the quality of these opportunities.

Outside sights and sounds affecting the WSA's opportunity for solitude are minor and are associated with timber harvest activities on adjacent lands and traffic on boundary roads.

Special Features

The south slopes of the WSA are deer winter range, with the southeastern portion designated as crucial deer winter range (see Map 5). Wilderness-associated species in the area include black bear, mountain lion, bobcat and golden eagle.

Approximately one mile of the Pacific Crest National Scenic Trail passes through the northwestern portion of the WSA. The highest recorded annual use for this portion of the trail was 8,600 hikers in 1980.

There is great ecological diversity in the area and it is suspected, though not verified, that the WSA contains four plant species of special interest: *Calochortus greenei, Cirsium ciliolatum, Limnanthes flocossa* ssp. *bellingeriana* and *Mimulus pygmaeus*. (These plants are discussed further in the Vegetation section.)

The area contains approximately 1,000 acres of a 2,200-acre SOMA. Suitable habitat within the WSA is likely used for foraging and nesting. The presumed nesting area is outside of the WSA boundary.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the Soda Mountain WSA is located in the Pacific Forest and Sierran Forest Provinces, and the potential natural vegetation is cedar-hemlock-Douglas fir forest, mixed conifer forest and chaparral.

The WSA is located in more than one physiographic province as described in the Oregon Natural Heritage Plan. Two provinces, Siskiyou (Klamath) Mountains and Western Slopes and Crest, meet in this vicinity, and a third, Western Oregon Interior Valleys, intermingles from the north. The WSA thus contains a variety of vegetation because of the transition zones among several ecosystems.

Ecosystems represented from each province include: from Siskiyou Mountains - Mixed Conifers (ponderosa - Douglas fir forest), mixed evergreen (Douglas fir and mixed evergreen hardwoods), white fir forest; from the Western Slopes and Crest - Southwestern Oregon mixed conifer forest, xeric and mexic mountain meadows-forest mosaic, grass bald; and from the Western Oregon Interior Valleys - grassland mosaic, chaparral.

There are three standard metropolitan statistical areas with populations over 100,000 within 5 hours' driving time of the area: Eugene/Springfield and Medford, Oregon; and Redding, California.

Energy and Mineral Development

Energy and mineral resources were evaluated from available geologic data combined with results from a BLM geochemical stream-sediment survey. Technical details of the evaluation are in a BLM report titled, "Assessment of Geology, Energy and Mineral Resources of the Klamath-Butte Falls Geologic Resource Area."

The WSA is within the Klamath-Butte Falls geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Table 3 shows the energy and mineral classification for the WSA. Map 4 shows where energy and mineral resources have moderate potential for occurrence in the WSA.

Exposed rocks in the area are composed of non-marine volcanics of the Western Cascade Range. These mid-Tertiary basaltic andesite flows are interbedded with breccias and pyroclastics. Underlying formations (based on regional geologic mapping) are composed of andesitic flows, pyroclastic and volcaniclastic early Tertiary sediments, and early Tertiary to Cretaceous non-volcanic, non-marine sediments. These strata have subsequently been faulted and intruded.

Energy Resources

Based on BLM's Mineral Potential Classification System, the entire WSA is considered to have a low potential for the occurrence of geothermal resources.

Again, based upon the same system, the entire WSA is considered to have a moderate potential for the occurrence of oil and gas because of the possibility of oil bearing rocks at depth.

The geologic favorability of other energy resources (coal, oil shale/tar sands, uranium/thorium) is considered to be low.

As of October 16, 1987, there were no oil/gas, geothermal or coal leases within the WSA.

Mineral Resources

Based upon BLM's Mineral Potential Classification System, approximately 2,000 acres of the WSA are considered to have a moderate potential for the occurrence of lead, molybdenum, copper, gold, mercury and silver. Molybdenum, copper, silver and mercury are strategic and critical minerals; however, there are no known deposits of strategic and critical minerals in the WSA.

As of October 16, 1987 there were no mining claims in the WSA.

Vegetation

Southwestern Oregon is a meeting place of a variety of climates, soils and topography, resulting in an extremely diverse vegetation. While the WSA is primarily in the Klamath (Siskiyou) Mountain province, there is interfingering with contiguous provinces contributing to great vegetational diversity and ecotonal overlap. Throughout the WSA there are three major vegetative types: stands of mixed conifers and hardwoods; extensive dense, brushy areas; and some open, grassy slopes.

Slightly more than half of the WSA have communities of white oak-ponderosa pine/Idaho fescue and a shrubby grassland of wedgeleaf ceanothus/bluebunch wheatgrass. These communities are generally found on shallow, rocky soils in the southeast and northwest portions of the area. The oak-pine/fescue community tends to occupy gently rolling terrain at lower elevations to steep, south-facing slopes at higher elevations. A variety of forbs is present. This community is generally in early to mid-seral stage. The shrubby grassland, which occurs on steep south-facing slopes, is in early seral stage.

About 20-30 percent of the WSA, near Lone Pine Ridge, supports a steep mountain grassland (Idaho fescue/wooly eriophyllum) and another shrubby grassland composed of birchleaf mountain mahogany-white oak/Idaho fescue. These communities are in early to mid-seral stage and occupy steep slopes.

The white fir-mixed fir forest community makes up 5-10 percent of the WSA vegetation, south of Soda Mountain itself, and extends into major creek drainages. This climax community contains white fir and Douglas fir as dominants and various shrubs and forbs in the understory.

The oak-shrub association is found over much of the WSA. It is a climax or subclimax community generally maintained by fire (disclimax). These shrubs, referred to as sclerophyllous because of their thickened, hardened leaves, tend to grow in dense stands. In this area, the plant community is dominated by wedgeleaf ceanothus (and sometimes sticky whiteleaf manzanita) with other species such as mountain mahogany and Pacific poison oak.

Based on habitat requirements, it is possible that four plant species of special interest (mentioned in the Special Features section) could be found in the WSA: *Calochortus greenei* (Greene's mariposa), *Cirsium ciliolatum* (Ashland thistle), *Limnanthes flocossa* ssp. *bellingeriana* (meadow foam) and *Mimulus pygmaeus* (Pygmy monkey flower). These four species are candidates for Federal listing as threatened or endangered. A sighting of *Calochortus greenei* has been reported to BLM, but its actual presence in the WSA has not been verified.

Wildlife

The wilderness study area contains good, healthy populations of black-tailed deer, bear and coyotes. There is also a small herd of elk west of the wilderness study area that is expected to expand into the area in the near future. Portions of the area contain abundant quail. These animals are all hunted in the WSA.

The area also contains mountain lions and bobcats. There is evidence of a pair of golden eagles in the study area. Their nest location is not known, but it is believed that they nest within the study area boundary based on repeated sightings of young adults in the area. The area contains approximately 1,000 acres of a 2,200-acre SOMA. Suitable habitat within the WSA is likely used for foraging and nesting. The presumed nesting area is outside of the WSA boundary.

This area provides spring, fall and winter range for a large herd of migratory black-tailed deer. The south slopes and lower elevations (under 2,500 feet) ranging into California constitute crucial winter range for this herd. The oak-shrub plant community on these lower elevations supplies forage for deer during periods when the ground is covered with snow. Wildlife harassment by off-road vehicles is not a major problem in the area due to the clay soils, dense vegetation and extremely steep slopes that seasonally restrict vehicle entry.

The climatic conditions, terrain and vegetative communities in the WSA result in a diversity of wildlife habitats. The plant communities in this area form one of the most unusual mosaics of habitat types found in southwestern Oregon, as described in the Vegetation section. The variety of stand conditions (seral stages), structure of vegetation and ecotones in these communities form the diversity of wildlife habitats in this WSA.

The diversity of vegetation provides nesting, resting and feeding habitat for the richness of wildlife species known or suspected to occur in this area. Water is the most limited of the basic wildlife requirements. The terrain and vegetation in the area supplies ample cover for protection from the weather and predators.

The diverse habitats found in this WSA have unique assemblages of wildlife species. For example, the black-backed woodpecker and hermit thrush are found associated with the white fir-mixed fir forest; the brown towhee and chipping sparrow with the shrub-grassland; and the Lewis' and acorn woodpecker in the oak-shrub community.

Camp Creek and Dutch Oven Creek contain viable rainbow trout populations. These populations currently receive light pressure from anglers.

Watershed

The WSA contains 10 miles of streams. Salt Creek (2 miles) is an intermittent stream. Camp Creek (4 miles) and Dutch Oven Creek (4 miles) flow year-round except during dry years when water persists in the deeper pools. Water quality in the WSA is generally good.

Soils

The soils in the WSA and their characteristics which could be affected are listed in Table 4.

Livestock Grazing

The Soda Mountain lies entirely within the Soda Mountain grazing allotment. Currently, all lands in the WSA are leased for livestock grazing. Table 5 summarizes existing livestock use in AUMs.

Existing livestock developments consist on one fence (3.5 miles) which crosses the WSA from north to south.

Livestock operators seldom use motor vehicles in this area because of the steep terrain. Horses are used for all management activities.

Wood Products Harvest

The wilderness study area includes 340 acres of public domain commercial forest management land classified for high intensity management. This acreage contains approximately 14 million board feet (14 mmbf) of standing timber volume and could produce an average annual harvest of 155 Mbf of timber. Reclassification of the 583 O&C acres as commercial forest lands resulted from a recent Timber Production Capability Classification (TPCC) update, which has not undergone formal land use planning. This O&C acreage is, therefore, not currently available for timber harvest under the existing timber management plan. The combined acreage (923 acres) of commercial forest land contains approximately 38 million board feet (5.1 mmbf) of standing timber volume, and could provide an average annual harvest of about 447,000 board feet (447 Mbf) per year or about 0.38 percent of the annual allowable cut for the Jackson-Klamath sustained yield units. Since 652 acres of the 923 total commercial acres are reserved for northern spotted owl management, only 271 acres would be available for timber production. This 271 acres of commercial forest land contains approximately 5.1 million board feet of standing timber volume, and could provide an average annual harvest of about 60,400 board feet (60.4 mmbf) per year or about 0.05 percent of the annual allowable cut for the Jackson-Klamath sustained yield units. The timber would be readily marketable as it is located only 30 road miles from Medford lumber mills.

Recreation Use

Recreation in the WSA includes hiking, camping, hunting, fishing, backpacking, rockhounding, wildlife observation, sightseeing and photography. Use of vehicles is limited to 2 miles of existing ways. Vehicle use is generally associated with hunting.

Overall, recreation use in the WSA amounts to approximately 8,000 - 9,000 visitor days per year, with day hikers along the Pacific Crest Trail (PCT) accounting for 90 percent of the use. Recreation use is currently increasing by one to two percent per year.

Local Personal Income

Livestock use at the current level of 317 AUMs, timber harvest of an average annual volume of 60.4 Mbf and recreation use totaling 8,500 visitor days per year are the primary resource outputs that generate economic activity in the WSA. Local personal income generated annually from these existing use levels amounts to approximately $3,804 for livestock grazing, $16,308 for timber production and $102,000 related to recreation use of the WSA, for an overall total of $122,112. The Statewide EIS volume discusses the term local personal income and how income figures have been derived.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resource and activities not significantly affected by any of the alternatives are not discussed. The Statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness (Proposed Action)

Recommended suitable for wilderness: 5,640 acres.
Recommended nonsuitable for wilderness: 0 acres

Impacts on Wilderness Values

All of the WSA would be designated wilderness, and wilderness values within the entire 5,640 acres would be protected by legislative mandate. Wilderness values of naturalness, solitude and primitive and unconfined recreation would be preserved. Special features including crucial deer winter range, spotted owl habitat and ecological diversity would also be protected.

Naturalness

The naturalness of the area's forest, grass and brush-covered ridges would be maintained. Closure of 2 miles of way (which influences a very small portion of the WSA) would allow the way to revegetate. Within 5 to 10 years, the two parallel tracks would revegetate, making the way unnoticeable.

Solitude

Opportunities for solitude provided by the area would be improved through the elimination of motorized use on the 2 miles of way. Vehicles would be limited to the boundary roads. The withdrawal from mineral entry as a result of designation would also help preserve the area's solitude by precluding casual surface exploration.

Primitive and Unconfined Recreation

Closure of the 2 miles of way to motorized use would result in a small increase in the area's opportunities for primitive and unconfined recreation. The quality of these experiences would improve with the revegetation of the way as a more natural setting for hiking, camping, horseback riding and hunting would be provided.

Special Features

Eliminating motorized vehicle use on the 2 miles of way would reduce impacts to crucial deer winter range by reducing harassment and allowing the way to revegetate. Wilderness designation would preserve spotted owl habitat from logging, but designation could reduce options under consideration by BLM to improve conditions on the deer winter range. The range is currently in a downward trend due to the growth of dense brushfields that have developed since fires were controlled. Since the area is a fire-dependent ecosystem, fire can be used to rejuvenate the desired species. Under the all wilderness alternative, more of the area could burn than during the time when fires were aggressively controlled. As a result, less of the area would be covered by brush, and deer habitat would improve.

Under the all wilderness alternative, wildfire would be allowed to play a more natural role in the ecosystem. Seeding with native species might also be allowed; however, this is not practical in the Soda Mountain WSA because of anticipated poor success. Seeding with non-native species would not be allowed. Thus, plant succession would return the area to dense brush fields sooner.

Conclusion: Wilderness designation of the entire 5,640 acres within the Soda Mountain WSA would result in protection and enhancement of existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close all 5,640 acres to mineral entry.

Energy Development

Exploration for oil and gas would be precluded on 5,640 acres. Due to the lack of geologic evidence to justify an extensive exploration/development program, only casual exploration, without development, is anticipated.

Conclusion: No impact to energy development is expected.

Mineral Development

Exploration for lead, molybdenum, copper, gold, mercury, silver, and aggregates, would be precluded on 5,640 acres. No development is projected due to the absence of sufficient geologic evidence, poor access and abundance of these minerals elsewhere.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

Little or no change would take place to vegetation over most of the area. Vegetative composition, as described in the vegetation section in the Affected Environment, would not change. Ecological status, which is mainly in late seral stage with some areas in mid-seral stage with a static to upward trend, would also not change due to continued grazing and wildlife browsing. Utilization of key forage species would remain at moderate use as long as land use plan objectives are met and residual ground cover is maintained.

The 2-mile way, once closed to vehicles, would revegetate in 5 to 10 years.

Conclusion: The 2 miles of way would revegetate. Little or no change would occur to vegetation on the rest of the area.

Impacts on Wildlife

Wildlife habitat for big game, upland game, furbearers and nongame species would be maintained under wilderness designation. Wildlife forage, adequate to meet projected ODFW goals, would be ensured in the preparation of livestock allotment management plans.

Closing the 2-mile way would reduce the slight harassment to wildlife by vehicles and the revegetation of the way would improve wildlife habitat to a minor degree.

Conclusion: Habitat for game and nongame species and their existing levels of populations would be maintained throughout the WSA and enhanced along the 2 miles of revegetated way.

Impacts on Watershed

There would be no detrimental changes to the watershed in the WSA. Revegetating the 2-mile way would reduce erosion potential.

Conclusion: Water quality would remain in generally good condition.

Impacts on Soils

Revegetating the 2-mile way would reduce erosion potential. There would be no impact to soils in the remainder of the WSA.

Conclusion: Soil productivity would be increased on 2 miles of revegetated way.

Impacts on Livestock Grazing

Livestock use would remain at the current use levels of 517 AUMs in even-numbered years and 117 AUMs in odd-numbered years Vehicle use on the 2-mile way would be precluded.

Since horses are used for all livestock management activities, this would not cause any inconvenience to livestock operators.

Conclusion: There would be no impacts to livestock grazing or livestock operators.

Impacts on Wood Products Harvest

Timber management actions would be precluded on all 5,640 acres including 923 acres of O&C and public domain commercial timber lands. Since 652 acres of the 923 total commercial acres are reserved for northern spotted owl management, timber values from 271 acres would be foregone as a result of wilderness designation. This 271 acres of commercial forest land contains approximately 5.1 million board feet (5.1 mmbf) of standing timber volume, and could provide an average annual harvest of about 60,400 board feet per year or about 0.05 percent of the annual allowable cut for the Jackson-Klamath sustained yield units.

Conclusion: An average annual harvest of 60.4 Mbf would be foregone.

Impacts on Recreation Use

Vehicle use of the 2 miles of way would be eliminated. This would affect an insignificant amount of visitors. As the public becomes more aware of the areas outstanding wilderness qualities, outstanding opportunities for primitive recreation and the area's outstanding ecological diversity, total visitor days are expected to increase slightly.

The area's recreation use level of 8,000-9,000 visitor days per year, which is increasing at an annual rate of one to two percent would increase at an annual rate of two to three percent. This would result in an overall use level of 19,125 visitor days per year.

Conclusion: The area's recreation use level would increase from approximately 8,500 visitor days per year to approximately 19,125.

Impacts on Local Personal Income

Livestock grazing would remain at 317 AUMs, while average annual timber production would be precluded. Overall recreation use would increase by 10,625 visitor days per year to 19,125.

Table 6 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $111,192 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $111,000.

Partial

Recommended suitable for wilderness: 5,057 acres
Recommended nonsuitable for wilderness: 583 acres

Impacts on Wilderness Values

Under this alternative, 5,057 acres would be designated wilderness, and wilderness values in this portion of the WSA would be protected by legislative mandate. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and special features, including crucial deer winter range, spotted owl habitat and ecological diversity would also be protected.

Wilderness values on the remaining 583 acres would not receive special legislative protection; however, 312 acres within the nonsuitable portion are within the SOMA and would be protected under the provisions of the Spotted Owl Management Plan guidelines. The remaining 271 acres would be subject to projected management actions.

Naturalness

The naturalness of the area's grass and brush-covered ridges and the forested drainages would be maintained. Closure of 2 miles of way would allow the way to revegetate within 5 to 10 years. The naturalness of the commercial forest lands recommended as nonsuitable but located within the SOMA, would also be maintained.

In the 271 acres outside of the SOMA and not designated wilderness, projected timber management practices would locally impair naturalness. Timber management actions on the 271 acres would include the harvest of an estimated 60.4 Mbf of timber annually, the construction, over time, of an estimated 3+miles of roads to harvest and manage all 271 acres, including planting, fertilizing, vegetation control, thinning and site preparation. Over time, all 271 acres could be disturbed by management actions and would be visible from approximately 400 acres within the suitable portion of the WSA.

Solitude

Although vehicle use on the 2 miles of way is very low, the elimination of such use would improve the opportunities for solitude. The withdrawal from mineral entry on 5,057 acres would also help preserve the area's solitude, by precluding casual surface mineral exploration.

There are no oil and gas leases or mining claims anywhere within the entire WSA and no direct evidence of any mineral or energy resources so no development activities are predicted even in the area recommended as nonsuitable.

Timber management activities, including road construction, timber harvest, site preparation (burning, ripping and vegetation management) and tree planting would locally impair opportunities for solitude. Removal of vegetative screening would create long-term degradation of solitude opportunities.

Primitive and Unconfined Recreation

Closure of the 2-mile way to motorized use on the 5,057 acres designated wilderness would slightly enhance opportunities for primitive recreation as a more natural setting for hiking, camping, horseback riding and hunting would be provided.

Within the 271 acres of the 583 acres not designated wilderness and not in the SOMA, intensive timber management activities would reduce primitive recreation opportunities by altering the natural setting for primitive recreation experiences.

Special Features

The closure of the 2-mile way would reduce impacts to crucial deer winter range. Deer habitat would improve as a result of less aggressive fire control, and spotted owl habitat would be preserved from logging.

Timber production would impact approximately 175 acres of crucial deer winter range and would involve construction of approximately 2 miles of road to allow access for harvest and regeneration activities based on current practices. Such road development would remove six to eight acres of wildlife habitat. The new roads would increase potential harassment of wildlife which may cause changes in uses or displacement.

The development of the timber resources would be periodic and varied so that the area would display a mosaic of stand conditions. This mosaic would be beneficial to some big game by providing a variety of forage conditions.

Special habitat features such as bear dens, eagle roosts and eagle nests would be protected by commitments in the current management framework plan.

Conclusion: Wilderness designation of 5,057 acres would protect and enhance existing wilderness values. Within the 583 acres not designated, projected activities would impair wilderness values over approximately 271 acres of timberlands and 400 acres of WSA lands within sight of these timberlands, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

Wilderness designation would close 5,057 acres to mineral entry. The remaining 583 acres not designated wilderness would remain open to mineral entry.

Energy Development

Exploration for oil and gas would be precluded on 5,057 acres. Due to the lack of geologic evidence to justify an extensive exploration/development program, only casual exploration, without development, is anticipated.

The 583 acres not designated wilderness would be available for oil and gas exploration and development; however, no development is expected for the same reasons identified above.

Conclusion: No impact to energy development is expected.

Mineral Development

Exploration for lead, molybdenum, copper, gold, mercury, silver and aggregates would be precluded on 5,057 acres. No development is anticipated due to the absence of sufficient geologic evidence, poor access and abundance of these minerals elsewhere.

Exploration for these minerals could occur on the 583 acres not designated wilderness. No development is expected to occur for the same reasons identified above.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

Little or no change would take place to vegetation within the 5,057 acres designated wilderness. As explained under the all wilderness alternative, vegetative composition and ecological status would not change. The 2-mile way which would be closed to motorized vehicles would revegetate in 5 to 10 years.

On 271 acres of the 583 not designated wilderness, intensive timber management activities would occur. Commercial timber seedlings would be planted on lands presently understocked, competing vegetation would be discouraged or removed using many possible techniques, and trees suitable for harvest would be cut.

On the remaining 312 acres of the 583, old growth timber would not be harvested in order to protect spotted owl habitat.

Conclusion: The 2 miles of way would revegetate. Little or no change would occur to vegetation on the rest of the 5,057 acres designated wilderness. On the 583 acres not designated wilderness, intensive timber management practices would occur on approximately 271 acres and the vegetation on the remaining 312 acres would remain unchanged due to its inclusion in the SOMA.

Impacts on Wildlife

On the 5,057 acres designated wilderness, wildlife habitat for all species would be maintained. Wildlife forage, adequate to meet projected ODFW goals, would be ensured in the preparation of livestock allotment management plans.

Closing the 2 miles of way would reduce the slight harassment to wildlife by vehicles and the eventual revegetation of the way would improve wildlife habitat to a minor degree.

On the 271 acres of the 583 recommended not suitable for wilderness, timber production would involve construction of approximately 3 miles of road to allow access for harvest and regeneration activities based on current practices. Such road development would remove 9 to 12 acres of wildlife habitat. The new roads would increase potential harassment of wildlife which may cause changes in uses or displacement.

The development of the timber resources would be periodic and varied so that the area would display a mosaic of stand conditions. This mosaic would be beneficial to some big game by providing a variety of forage conditions.

Special habitat features such as bear dens, eagle roosts and eagle nests would be protected by commitments in the current management framework plan.

On the 312 acres within the SOMA, no impacts on wildlife are anticipated, since timber harvest would be precluded and no other actions are projected.

Conclusion: Habitat for wildlife species and their existing levels of populations would be maintained throughout the 5,057 acres designated wilderness and also in 312 acres of the WSA not designated wilderness as a result of its inclusion in the SOMA. Habitat would be enhanced along the 2 miles of way.

On the 271 acres of commercial timberlands not designated wilderness, wildlife populations of game and non-game species would sustain minor and temporary levels of harassment due to vehicle use on the projected roads and during harvest and reforestation activities. Changes in habitat development of the timber resources would be beneficial to some big game species.

Impacts on Watershed

There would be no changes to the watershed within the 5,057 acres recommended suitable for wilderness nor to the 312 acres recommended nonsuitable but within the SOMA.

On the 271 acres not designated wilderness and outside the SOMA, timber management activities would adversely affect seasonal streamflow characteristics (peaks and low flows) and instream water quality (sedimentation, temperature, dissolved oxygen, nutrients and organic substances) in the main drainages dissecting the WSA.

Adverse impacts would be limited because of the application of site-specific mitigating measures during harvest. Construction of up to three miles of new road would increase sedimentation in the drainages, especially during storm and snow melt runoff.

Increase in sedimentation due to logging would be transitory returning to pre-logging levels within five years. Some sedimentation due to road runoff would persist indefinitely.

Conclusion: Water quality would be reduced by projected timber management activities of BLM.

Impacts on Soils

Revegetation of the 2-mile way would reduce erosion potential. No impacts to soils would occur on the remainder of the 5,057 acres designated wilderness nor on the 312 acres not designated but within the SOMA.

On the 271 acres not designated wilderness and outside the SOMA, timber harvest activities would result in a loss in soil productivity directly proportional to amounts of road construction, yarding system utilized, and burning activities during site preparation. These are usually short-term effects, declining to pre-logging levels within 5 to 10 years.

Conclusion: Soil productivity would be reduced in proportion to management activities on 271 acres, and increased on 2 miles of revegetated way.

Impacts on Livestock Grazing

Livestock use would remain at the current use levels as explained under the all wilderness alternative for the entire WSA.

Horses are used for all livestock management actions. It is possible that vehicles would be used on the 3 miles of roads constructed if roads were built for projected timber sale activities on the 271 acres not designated and outside the SOMA.

Conclusion: Use would remain at current use levels with no added inconvenience anticipated from closing the 2-mile way.

Impacts on Wood Products Harvest

Harvest would be precluded on 312 acres of the 583 acres of commercial forestland not designated wilderness but within the SOMA. On the 271 acres of commercial timberlands not designated wilderness and outside the SOMA, the existing timber volume is estimated to be 5.1 million board feet (5.1 MMbf). This volume could provide an average annual harvest of 60,400 board feet (60.4 Mbf) or 0.05 percent of the annual allowable cut for the Jackson-Klamath sustained yield units.

Conclusion: An average annual harvest of 60.4 Mbf would be available.

Impacts on Recreation Use

The same decrease in recreational opportunities dependent on motorized use of the way and increased use identified under the all wilderness alternative would occur under this alternative on the 5,057 acres designated wilderness and the 312 acres not designated wilderness but within the SOMA.

On the 271 acres of commercial timberlands not designated wilderness, opportunities associated with motorized vehicles could occur. Increased access to the designated 5,057 acres could be provided via the 3 miles of new logging roads.

The area's recreation use level of 8,000-9,000 visitor days per year, which is increasing at an annual rate of 1 to 2 percent would increase at an annual rate of 2 to 5 percent for the entire 5,057 acres designated wilderness and the 583 acres not designated wilderness. This would result in an overall use level of 23,375 visitor days per year.

Conclusion: The area's recreation use level would increase from approximately 8,500 visitor days per year to approximately 23,375.

Impacts on Local Personal Income

Livestock grazing would remain at 317 AUMs, while average annual timber production would remain at 60.4 Mbf. Overall recreation use would increase by 14,875 visitor days per year.

Table 6 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $178,500 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $178,500.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres
Recommended nonsuitable for wilderness: 5,640 acres

Impacts on Wilderness Values

Under the no wilderness alternative, the entire 5,640 acres would not be designated wilderness and wilderness values would not receive special legislative protection. Wilderness values of naturalness, solitude, primitive and unconfined recreation, and the area's special features, including crucial deer winter range, spotted owl habitat and ecological diversity, would be subject to the effects of the projected management actions. Projected actions include continued recreational vehicle use limited to existing roads and ways and commercial timber management activities on 271 acres.

Naturalness

Continued vehicle use of the 2-miles way would maintain the impact of the vehicle tracks upon naturalness on approximately 200 acres (3.5 percent of the WSA). Most of this influence upon the area's naturalness occurs near the south and southeast boundaries.

Only casual mineral exploration is expected to occur, with only minor short-term disturbance to naturalness. Since there are no livestock projects planned, no wildlife projects planned, and no allocation increases planned, there should be no impacts to naturalness by these activities.

Projected timber harvest would eventually alter naturalness of the 271 acres available for harvest, visually influencing approximately 400 acres of the WSA.

Solitude

Continued vehicle use on the 2-mile way would cause infrequent, short-term local impairment of solitude opportunities adjacent to the activity. Solitude opportunities would be impaired in the vicinity of the 271 acres of commercial timberlands both in the short term and long term, as a result of forest management activities. Solitude opportunities in the large unroaded core area would remain.

Primitive and Unconfined Recreation

Vehicle use would continue to be limited to existing roads and ways. However, such use would continue to intrude upon primitive, non-motorized recreation opportunities in the vicinity of the 2 mile way in the WSA.

Within the 271 acres of commercial timberlands outside the SOMA, intensive timber management activities would reduce primitive recreation opportunities by altering the natural setting for primitive recreation experiences.

Special Features

Continued vehicle use of the 2-mile way would maintain impacts to crucial deer winter range through harassment of wildlife and removal of an estimated two acres of vegetation. More aggressive fire control would result in less improvement in deer habitat since less brush would be burned during wildfires.

Spotted owl habitat would be preserved in the 1,000 acres of SOMA within the WSA.

Conclusion: In the absence of wilderness designation, projected activities would directly impact an estimated 275 acres and indirectly impair wilderness values over approximately 600 acres of the WSA, due to visual influences, with further declines from other potential uses over the long term.

Impacts on Energy and Mineral Development

The entire 5,640-acre WSA would be open to mineral entry.

Energy Development

Only casual exploration for oil and gas resources is expected. An extensive exploration/development program is not anticipated due to a lack of sufficient geologic evidence to support it.

Conclusion: No impact to energy development is expected.

Mineral Development

Only casual exploration for lead, molybdenum, copper, gold, mercury, silver and aggregates is expected. A major exploration/development program is not anticipated due to a lack of sufficient geologic evidence to support it.

Conclusion: No impact to mineral development is expected.

Impacts on Vegetation

With the exception of the 2-mile way, which would not revegetate, impacts to vegetation would be the same as the partial alternative.

Timber management activities projected for 271 acres of the WSA would be the only projected impacts on vegetation.

Conclusion: The 2-mile way would not revegetate. Little or no change would occur on 5,369 acres of the WSA. Intensive timber management practices would alter vegetation on 271 acres. Motorized equipment could be used for fire suppression.

Impacts on Wildlife

Occasional harassment to wildlife by vehicles would continue to occur on the 2-mile way. No impacts are projected on 5,369 acres of the WSA. On the 271 acres of commercial timberlands outside the SOMA and within the WSA, timber production would involve construction of approximately 3 miles of road to allow access for harvest and regeneration activities based on current practices. Such road development would remove 9 to 12 acres of wildlife habitat. The new roads would increase potential harassment of wildlife which may cause changes in uses or displacement. The development of the timber resources would be periodic and varied so that the area would display a mosaic of stand conditions. This mosaic would be beneficial to some big game by providing a variety of forage conditions.

Special habitat features such as bear dens, eagle roosts and eagle nests would be protected by commitments in the current management framework plan.

Conclusion: Wildlife populations of game and nongame species would sustain minor and temporary levels of harassment due to human activity associated with existing vehicle use on the 2-mile way, and during timber management activities on the 271 acres of timberlands outside the SOMA. Changes in habitat by the development of the timber resources would be beneficial to some big game species.

Impacts on Watershed

There would be no detrimental changes to the watershed within the 5,369 acres which are within the SOMA or not commercial timberlands. This area includes the Dutch Oven and west fork of Camp Creeks.

On the 271 acres of commercial timberlands outside the SOMA, timber management activities would adversely affect seasonal streamflow characteristics (peaks and low flows) and instream water quality (sedimentation, temperature, dissolved oxygen, nutrients and organic substances) in the main drainages dissecting the WSA.

Adverse impacts would be limited because of the application of site-specific mitigating measures during harvest. Construction of up to 3 miles of new road would increase sedimentation in the drainages, especially during storm and snow melt runoff.

Increase in sedimentation due to logging would be transitory returning to pre-logging levels within five years. Some sedimentation due to road runoff would persist indefinitely.

Conclusion: Water quality would be reduced by projected timber management activities.

Impacts on Soils

Continued vehicle use of the 2-mile way would maintain the erosion potential and loss of soil productivity in the bare tracks.

Impacts to soils would occur on the 271 acres not recommended suitable and outside the SOMA. On these lands, timber harvest activities would result in a loss in soil productivity directly proportional to amounts of road construction, yarding system utilized, and burning activities during site preparation. These are usually short-term effects, declining to pre-logging levels within 5 to 10 years.

Conclusion: Soil productivity would be reduced in proportion to management activities on 271 acres and would remain unchanged on the rest of the area.

Impacts on Livestock Grazing

Livestock use would remain at the current use levels as explained under the all wilderness alternative for the entire WSA.

Vehicles could be used on the 2-mile way and might possibly be used on the 3 miles of projected logging roads developed in the 271 acres of commercial timberlands. However, most livestock management currently utilizes horses for access.

Conclusion: Livestock use would remain at current levels and management would be unaffected.

Impacts on Wood Products Harvest

Timber management actions would continue to be precluded on 312 acres of the 583 acres of commercial timberlands in the WSA. On the 271 acres of commercial timberlands which are outside the SOMA, a total volume of 5.1 million board feet (5.1 MMbf) would provide an average annual harvest of 60,400 board feet (60.4 Mbf) or 0.05 percent of the annual allowable cut for the Jackson-Klamath sustained yield units. Site preparation activities, planting, fertilizing, vegetation controls, thinnings, and harvest activities could occur on 271 acres.

Conclusion: Timber harvest on 271 acres would result in an average annual yield of 60.4 Mbf.

Impacts on Recreation Use

Motorized vehicle use of the 2-mile way and any of the projected 3 miles of logging road would continue. Primitive recreation opportunities would continue to exist in all but the 271 acres of commercial timberlands that are outside the SOMA. Overall, declines in primitive recreation opportunities would be offset by increases in vehicle-dependent activities, thus maintaining current recreation use trends.

The area's recreation use levels of 8,000-9,000 visitor days per year, which is increasing at an annual rate of 1 to 2 percent, would not be affected. This would result in an overall use level of 14,875 visitor days per year.

Conclusion: The area's recreation level would increase from approximately 8,500 visitor days per year to approximately 14,875.

Impacts on Local Personal Income

Livestock grazing would remain at 317 AUMs, while average annual timber production would remain at 60.4 Mbf. Overall recreation use would increase by 6,375 visitor days per year.

Table 6 shows the effects on local personal income generated from these activities. The total effect on local personal income would be a net increase of $76,500 per year.

Conclusion: Annual local personal income generated from resource outputs in the WSA would increase by approximately $76,500.

Unavoidable Adverse Impacts of the Proposed Action

Under the Proposed Action (All Wilderness), mineral exploration and commercial timber management activities on 271 acres would be foregone. Vehicle use on 2 miles of way would be excluded, slightly reducing opportunities for those who prefer this type of recreation.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the Proposed Action, most existing short-term uses would continue. The long-term productivity of the wilderness values would be preserved.

Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

The Soda Mountain WSA would be manageable as wilderness in both the all wilderness and partial wilderness alternatives. However, at times, it would be difficult to preserve wilderness values of the margins of the area because of timber management activities on adjacent lands.

Rationale for Selection of the Proposed Action

The proposed action being the all wilderness alternative is a change from the proposed action of no wilderness in the Draft EIS. This change is due in part to a portion of the area being designated a Spotted Owl Management Area (SOMA), which adds or emphasizes wildlife values previously not emphasized and to new and additional ecological information. This additional information caused BLM to determine that the benefits of preserving the area's wilderness values, including outstanding wildlife habitat, outstanding ecological diversity, and outstanding opportunities for solitude and primitive recreation, would outweigh low mineral resource values, continued vehicle use on a 2-mile way and an extremely low amount of commercial timber.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendation or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume. Copies of all hearing transcripts and comment letters received on the draft EIS and Supplement are on file for public review at the BLM Oregon State Office.

Comment: The BLM failed to consider enhanced alternatives. **Response:** See discussion in Section 2, Description of the Alternatives, regarding alternatives considered but not analyzed.

Comment: Another alternative to wilderness that keeps out ORVs, protects the area and won't reduce AUMs is preferred. **Response:** See discussion in Section 2, Livestock Grazing, regarding Wilderness and AUMs. Designations other than ones related to wilderness are beyond the scope of this EIS.

Comment: An alternative that would allow controlled burns for wildlife and no timber harvest is suggested. **Response:** To remove commercial timberlands from possible harvest, other than by wilderness designation, would take a land use decision beyond the scope of this EIS. This wilderness study involves an amendment to an existing land use plan solely for the purpose of adding consideration of wilderness designation to the plan.

Comment: Economic values used in the EIS are skewed to favor commodity production. **Response**: See discussion in Section 3, Local Personal Income, for the derivation of economic factors.

Comment: BLM did not consider the effect of Class I airshed designations on adjacent private lands. **Response:** Class I airshed designations are discussed in Section 1, Scoping.

Comment: The Pacific Crest Trail is a special feature. **Response:** Discussion of the Pacific Crest Trail has been added to this appendix, both as a Special Feature and as a recreational use.

Comment: The mineral analysis is not accurate. **Response:** Mineral analyses are based on the best information available to the BLM including State and Federal agency reports and field survey data. No substantive information was provided in the comment requiring a response.

Comment: People depend on the water from the WSA and logging will cause siltation. **Response:** Impacts on watershed from projected logging activities are analyzed in the Environmental Consequences section of this appendix (Section 4).

Comment: Wildlife analysis did not consider burning, spotted owls, or effects of timber sales on wildlife. **Response:** No burning is projected within the WSA; spotted owls are now addressed due to a new designation of portions of the WSA as a SOMA; the effects of timber sale activities on wildlife are analyzed in Section 4, Environmental Consequences.

Comment: Area gets high recreation use. **Response:** Further research has provided more accurate use figures and the appropriate sections have been updated.

Comment: It is possible that sensitive plant species exist in the WSA. **Response:** Section 3, Special Features/Vegetation has been expanded to discuss possible sensitive plant species present.

Comment: A sighting of *Fritillaria glauca* (a candidate species) was reported within the WSA. **Response:** Samples of the subject plants were collected by BLM and identified by the Humboldt State University Herbarium and found to be *Fritillaria purdyi* (not a candidate species).

Comment: A band of wild horses within the WSA was not discussed. **Response:** The wild horse herds on the Medford District are all located to the east of the WSA and on the other side of the Jenny Creek Canyon. The District's Wild Horse Management Plan states that any horses west of Jenny Creek will not be managed as wild horses, and there are none there now.

Comment: The impact analysis is inadequate in relation to harvest of timber on lands in the southern part of the WSA, especially in Dutch Oven Creek area. **Response:** The impact analysis includes a scenario of potential timber harvesting and the SOMA now precludes harvest in the Dutch Oven Creek area.

Comment: O&C timberlands should not be included in the WSA. **Response:** Noncommercial O&C timberlands were determined to not be exempt from wilderness study while commercial O&C timberlands were (see Wilderness Inventory handbook, 1978). Recent reclassifications have not been through the public review process.

Comment: DEIS did not recognize the outstanding ecological diversity in the WSA. **Response:** The area's ecological diversity is now recognized in Section 3, Affected Environment.

Table 1. Summary of Proposed Management Under Each Alternative, Soda Mountain WSA (OR-11-17)

Proposed Management	All Wilderness	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	5,640	5,057	0
Acres Closed to ORVs by Wilderness Designation[1]	5,640	5,057	0
Miles of Ways Closed	2	2	0
Miles of Road Constructed	0	3	3
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	5,640	5,057	0
Acres Available for Commercial Timber Management	0	271	271
Average Annual Volume of Timber Harvested (Mbf)	0	60.4	60.4

[1] Except for a 2-mile way in the WSA, the acreage shown is already closed to cross-country vehicle use through a "limited" ORV designation.

Table 2. Summary of Environmental Consequences of Alternatives, Soda Mountain WSA (OR-11-17)

Resource or Activity	All Wilderness (Proposed Action)	Partial Wilderness	No Wilderness/ No Action
Wilderness Values	Wilderness designation of 5,640 acres would result in protection and enhancement of existing wilderness values.	Wilderness designation of 5,057 acres would protect and enhance existing wilderness values. Projected activities would directly impair wilderness values on 271 acres and indirectly over 400 acres.	Projected management actions would directly impair wilderness values over approximately 275 acres and indirectly over 600 acres.
Energy and Mineral Development	No impact to energy or mineral development is expected.	No impact to energy or mineral development is expected.	No impact to energy and mineral development is expected.
Vegetation	2 miles of way would revegetate. Little or no change would occur to vegetation on the rest of the area.	2 miles of way would revegetate. Little or no change would occur to vegetation on the rest of the 5,057 acres designated. Vegetation on 271 acres of the 583 not designated would be subject to intensive timber management practices. The remaining 312 acres would remain unchanged due to the SOMA.	2 miles of way would not revegetate. Intensive timber management practices would occur on 271 acres. Little or no change would occur to vegetation on remaining 5,369 acres.
Wildlife	Habitat and populations would be maintained throughout and enhanced along the 2 miles of revegetated way.	Habitat and populations would be maintained throughout the 5,057 acres designated plus 312 acres within the SOMA. Wildlife would sustain temporary and minor levels of harassment during timber management practices on 271 acres not designated.	Wildlife would sustain minor and temporary levels of harassment due to vehicle use and timber management activities on 271 acres.
Watershed	Water quality would remain in generally good condition.	Water quality would be reduced by projected timber management activities.	Water quality would be reduced by projected timber management activities.
Soils	Soil productivity would increase on 2 miles of revegetated way. No change to soil productivity on the rest of the area.	Soil productivity would be reduced in proportion to management activities on 271 acres, and increased on 2 miles of revegetated way.	Soil productivity would be reduced in proportion to management activities on 271 acres, and remain unchanged on the rest of the area.
Livestock Grazing	There would be no impact to livestock grazing or livestock operators.	Use would remain at current use levels with no added inconvenience anticipated from closing the 2-mile way.	Use would remain at current levels and management would be unaffected.
Commercial Timber Management	An average annual harvest of 60.4 Mbf would be foregone.	Timber would be available for harvest on 271 acres. An average annual harvest of 60.4 Mbf would be available.	Timber would be available for harvest on 271 acres. An average annual harvest of 60.4 Mbf would be available.

Table 2. Summary of Environmental Consequences of Alternatives, Soda Mountain WSA (OR-11-17)

Resource or Activity	All Wilderness (Proposed Action)	Partial Wilderness	No Wilderness/ No Action
Recreation Use	The area's recreation use level would increase from approximately 8,500 visitor days per year to approximately $19,125.	The area's recreation use level would increase from approximately 8,500 visitor days per year to approximately 23,375.	The area's recreation use level would increase from approximately 8,500 visitor days per year to approximately 14,875.
Local Personal Income	Annual local personal income would increase by approximately $111,000.	Annual local personal income would increase by more than $178,000.	Annual local personal income would increase by more than $76,000.

Table 3. Classification of Energy and Mineral Potential, Soda Mountain WSA (OR-11-17)

Commodity Metals	Area	Level of Potential	Level of Certainty
Lead, Molybdenum	See Map 4	M	B
	Rest of WSA	L	A
Copper, gold	See Map 4	M	B
mercury, silver	Rest of WSA	L	A
Geothermal	Entire WSA	L	A
Uranium/Thorium	Entire WSA	L	B
Coal	Entire WSA	L	B
Oil/Gas	Entire WSA	M	A
Tar Sands/Oil Shale	Entire WSA	L	B
Limestone	Entire WSA	O	A
Bentonite	Entire WSA	O	A
Zeolite	Entire WSA	O	A
Diatomite	Entire WSA	O	A
Sodium/Potassium	Entire WSA	O	A
Aggregates	Entire WSA	M	C

Legend:

Level of Potential
O - No indication of accumulations of energy/mineral resource.
L - Low potential for accumulations of energy/mineral resource.
M - Moderate potential for accumulations of energy/mineral resource.
H - High potential for accumulations of energy/mineral resource.

Level of Certainty
A - Insufficient data or no direct evidence.
B - Indirect evidence available.
C - Direct evidence but quantitatively minimal.
D - Abundant direct and indirect evidence.

Table 4. Soil Characteristics of the Soda Mountain WSA (OR-11-17)

	Depth	Slope Erodability	Stability	Compaction Hazard	Other
Hobit loam (845)	20-40"	Low	High to moderate.	Very low BD increases loss of water holding capacity, etc; low clay increases chance to ameliorate compaction by ripping.	Relatively high OM in surface. Surface compaction hazard and assoc. disturbance could cause loss of OM or nutrients.
Farva cobbly loam (809)	20-40"	Low, though often assoc. with less stable parent materials.	High to moderate	Moderate	Low in surface organic matter, very rocky.
McNull gravelly	40"	Moderate-prone to rill or gully erosion if rutted.	May be unstable and slump prone if parent material is pyroclastic.	Moderate to high. Clay makes compaction difficult to ameliorate by ripping.	Least stable in WSA roads and timber harvest could destabilize soils.
Woodseye Stony loam (806)	10-20"	Moderate; shallow depth makes any soil loss less tolerable.	Stable	Moderate	—
McMullin-Rock	10-20"	Same as Woodseye.	Stable	Moderate	—
Heppsie Clay (709)	20-40"	Moderate to high; rutting by vehicles may cause gully erosion.	Moderate to low	Moderate to high. Clay makes compaction difficult to ameliorate.	Roads could destabilize slopes.
Skookum very cobbly clay loam (705)	20-40"	Similar to Heppsie; slow infiltration rates increase erosion hazard.	Moderate.	Similar to Heppsie; clay, rocks and steep slopes make amelioration of compaction by ripping difficult.	Very rocky throughout profile.

Key to abbreviations: OM = Organic Matter BD = Bulk Density

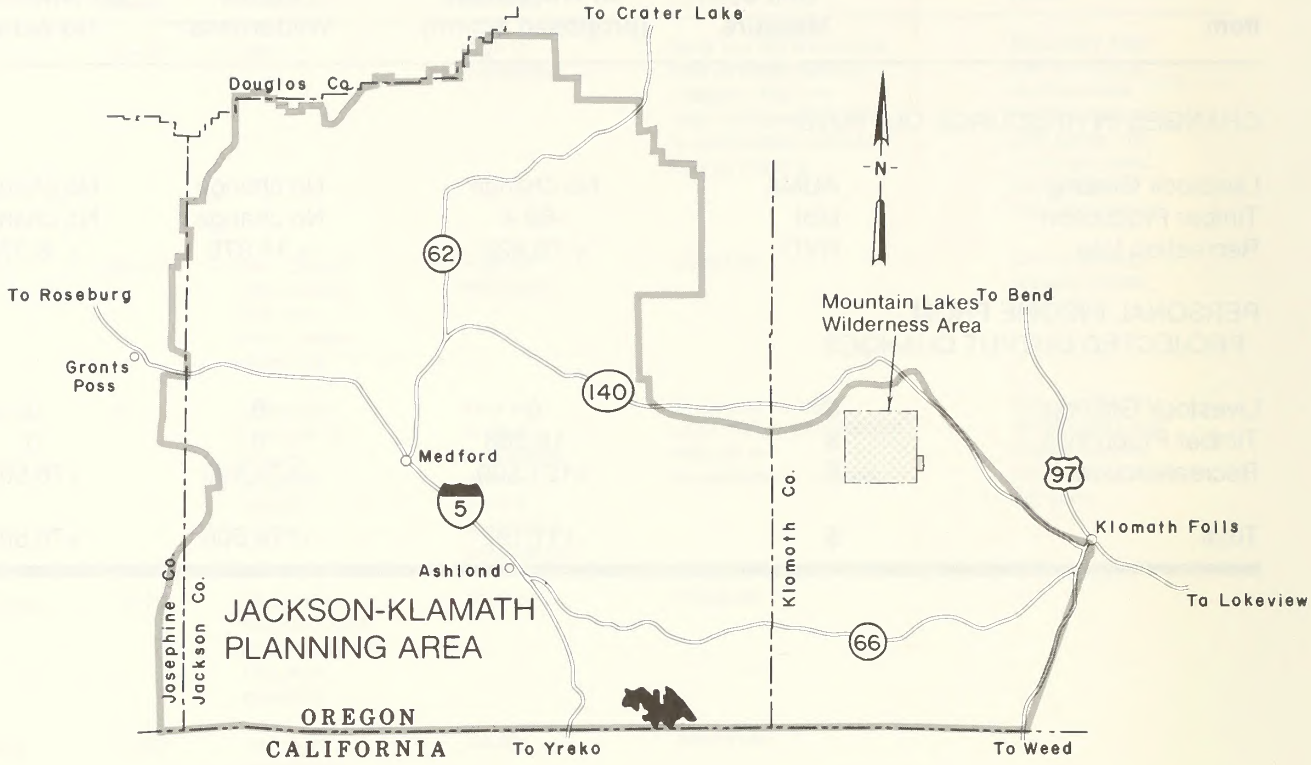
Table 5. Existing Livestock Use, Soda Mountain WSA (OR-11-17)

Grazing Allotment	Licensed AUMs in Allotment	Period of Use	Percent of Allot. in WSA	Current Estimated Use in WSA (AUMs)
Soda Mtn.	4,011	06/01-07/15	16	317[1]

[1] Quantity shown is average of 117 and 517 AUMs, respectively, in alternate years.

Table 6. Effects of Alternatives on Local Personal Income, Soda Mountain WSA (OR-11-17))

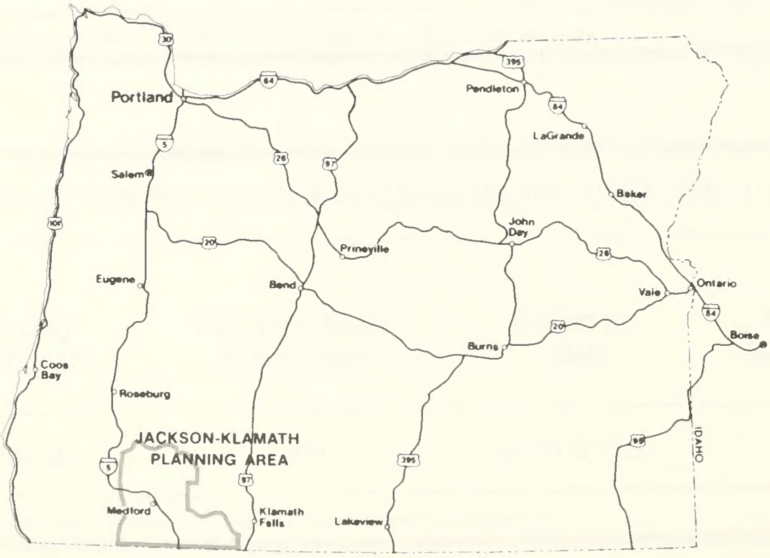
Item	Unit of Measure	All Wilderness (proposed action)	Partial Wilderness	No Wilderness No Action
CHANGES IN RESOURCE OUTPUTS				
Livestock Grazing	AUMs	No change	No change	No change
Timber Production	Mbf	-60.4	No change	No change
Recreation Use	RVD	+ 10,625	+ 14,875	+ 6,375
PERSONAL INCOME FROM PROJECTED OUTPUT CHANGES				
Livestock Grazing	$	0	0	0
Timber Production	$	- 16,308	0	0
Recreation Use	$	+127,500	+178,500	+76,500
Total	$	-111,192	+178,500	+76,500



LEGEND

■ Soda Mountain WSA

▨ Other WSA's



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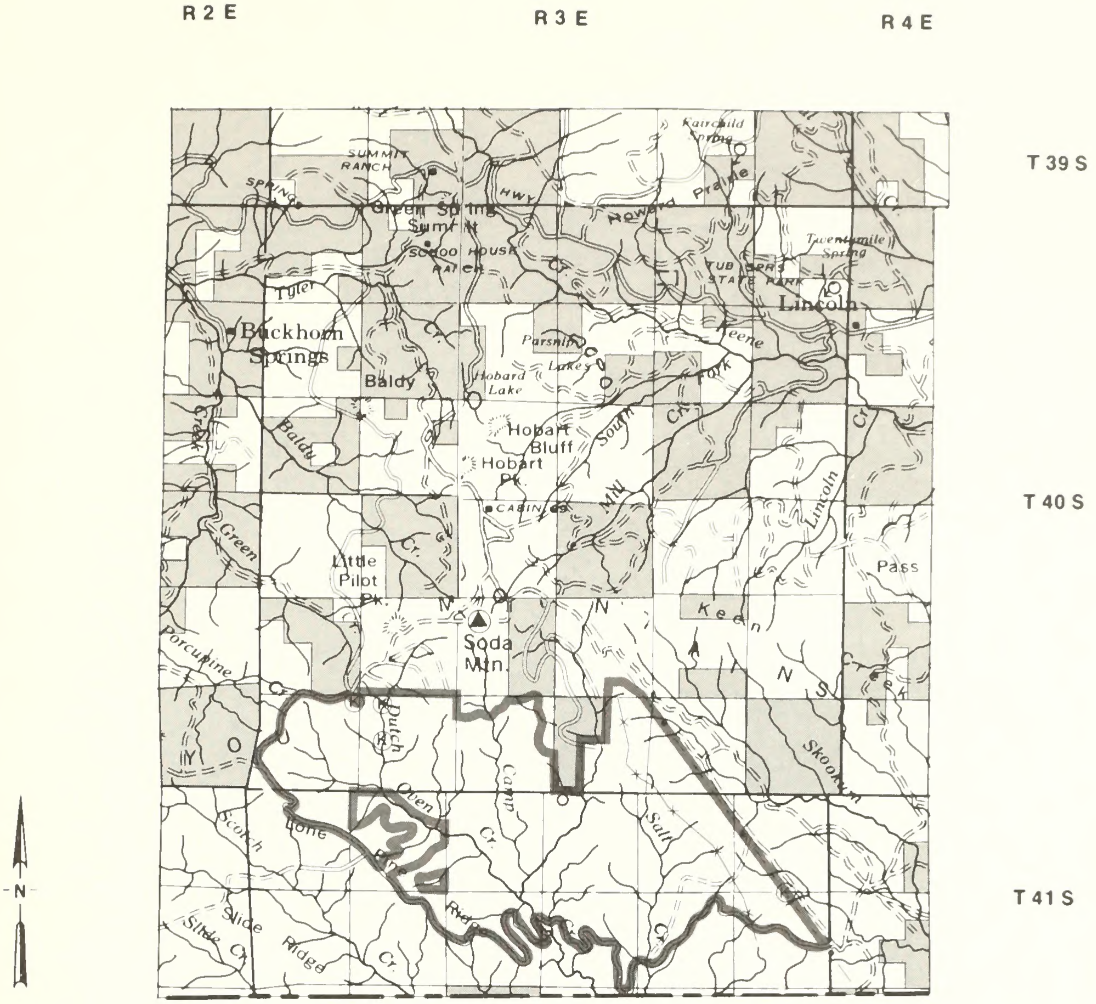
Soda Mountain WSA
OR-11-17

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▭ BLM Land in WSA Studied Under Section 603 of FLPMA

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ Private

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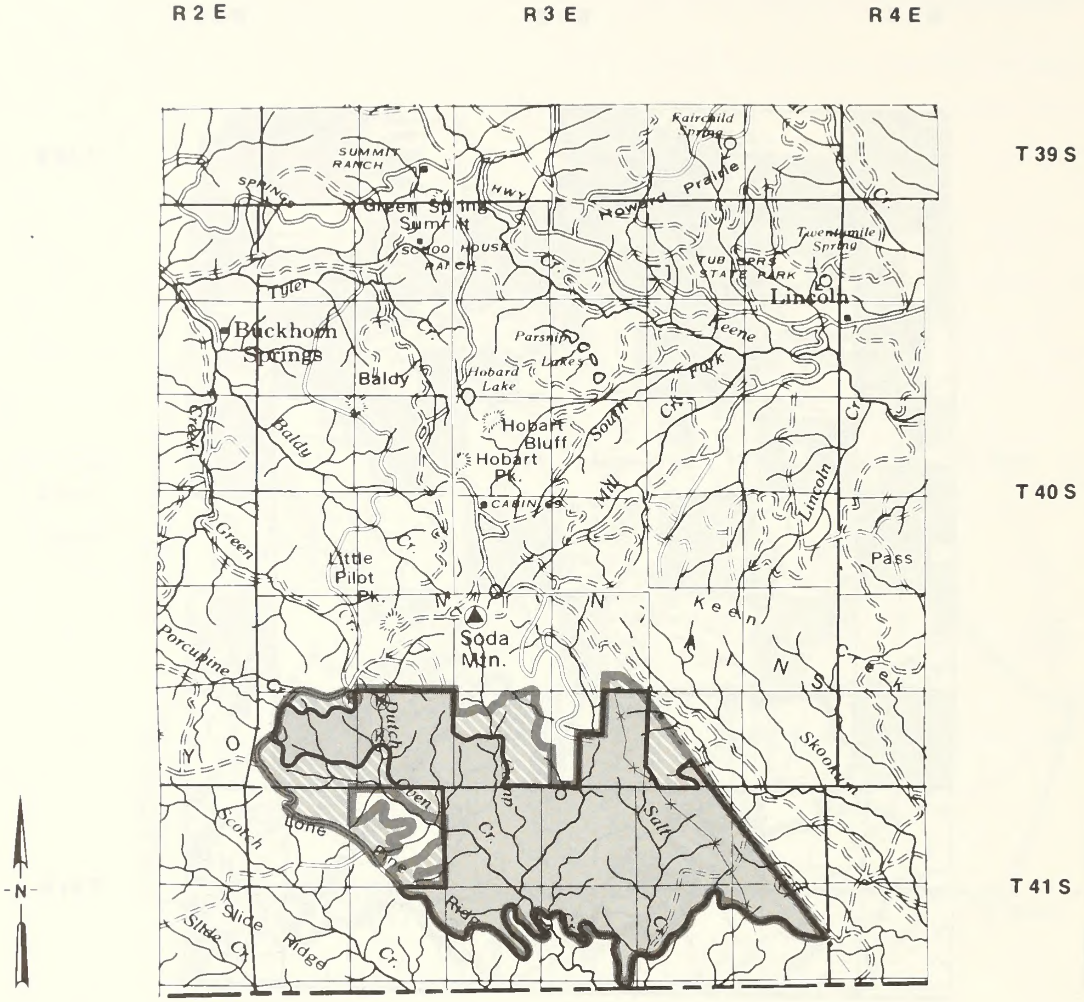
Soda Mountain WSA
OR-11-17

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▬ Wilderness Study Area Boundary

■ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

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Soda Mountain WSA
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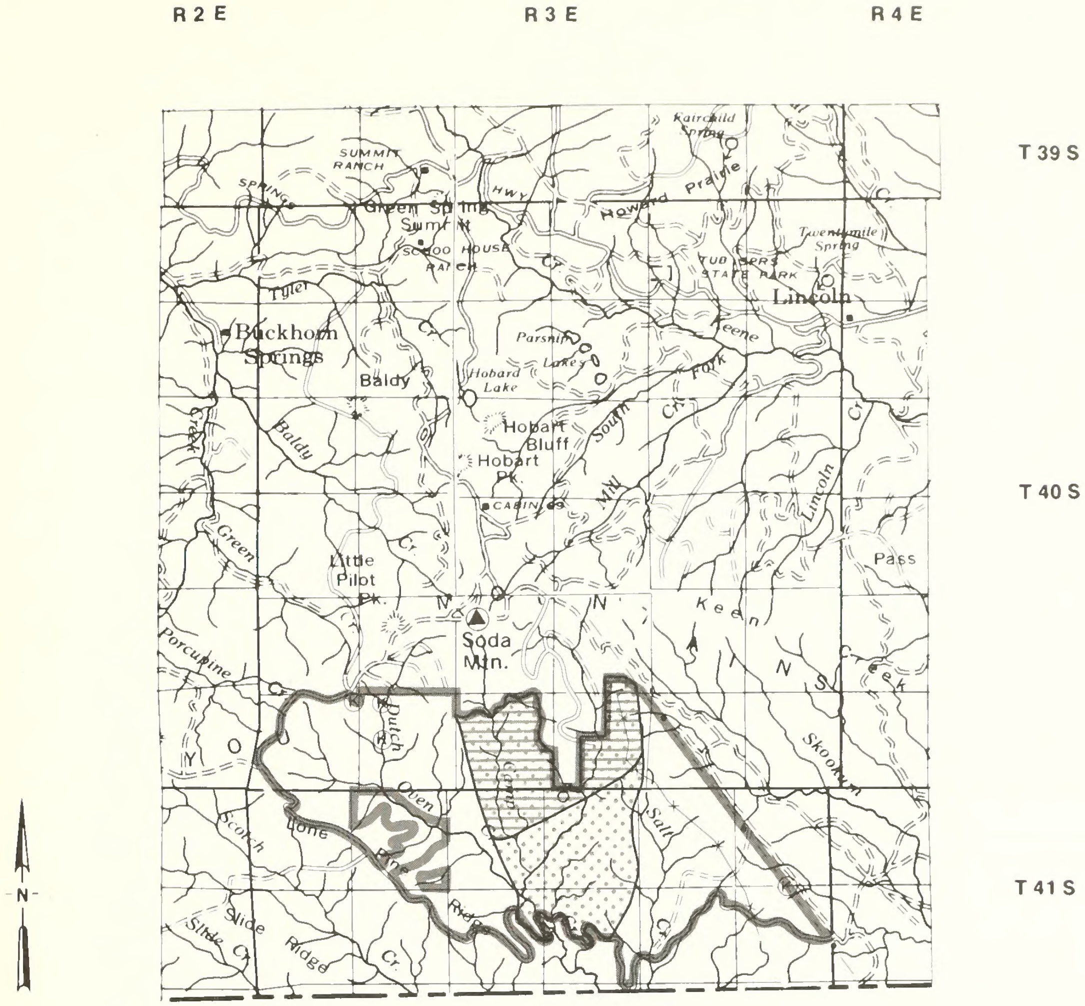
PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



▤ **Moderate Potential (MB) for Copper, Gold, Mercury and Silver**

░ **Moderate Potential (MB) for Lead and Molybdenum**

Entire WSA:
Moderate Potential
(MA) for Oil and Gas
(MC) for Aggregates
(Mineral Material)

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Soda Mountain WSA
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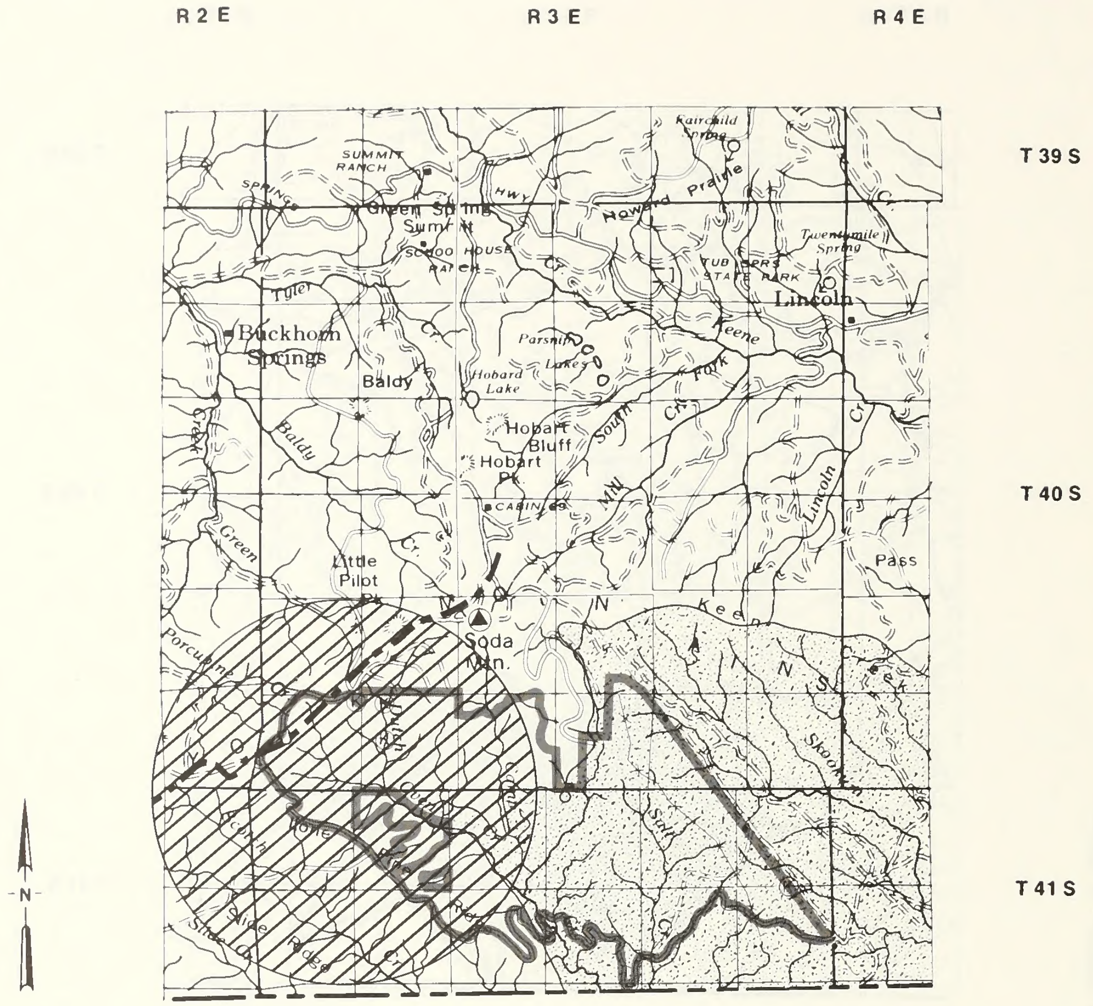
MODERATE OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4



LEGEND

Wilderness Study Area Boundary

░ Crucial Deer Winter Range

▨ Spotted Owl Management Area

▪▬▪ Pacific Crest National Scenic Trail

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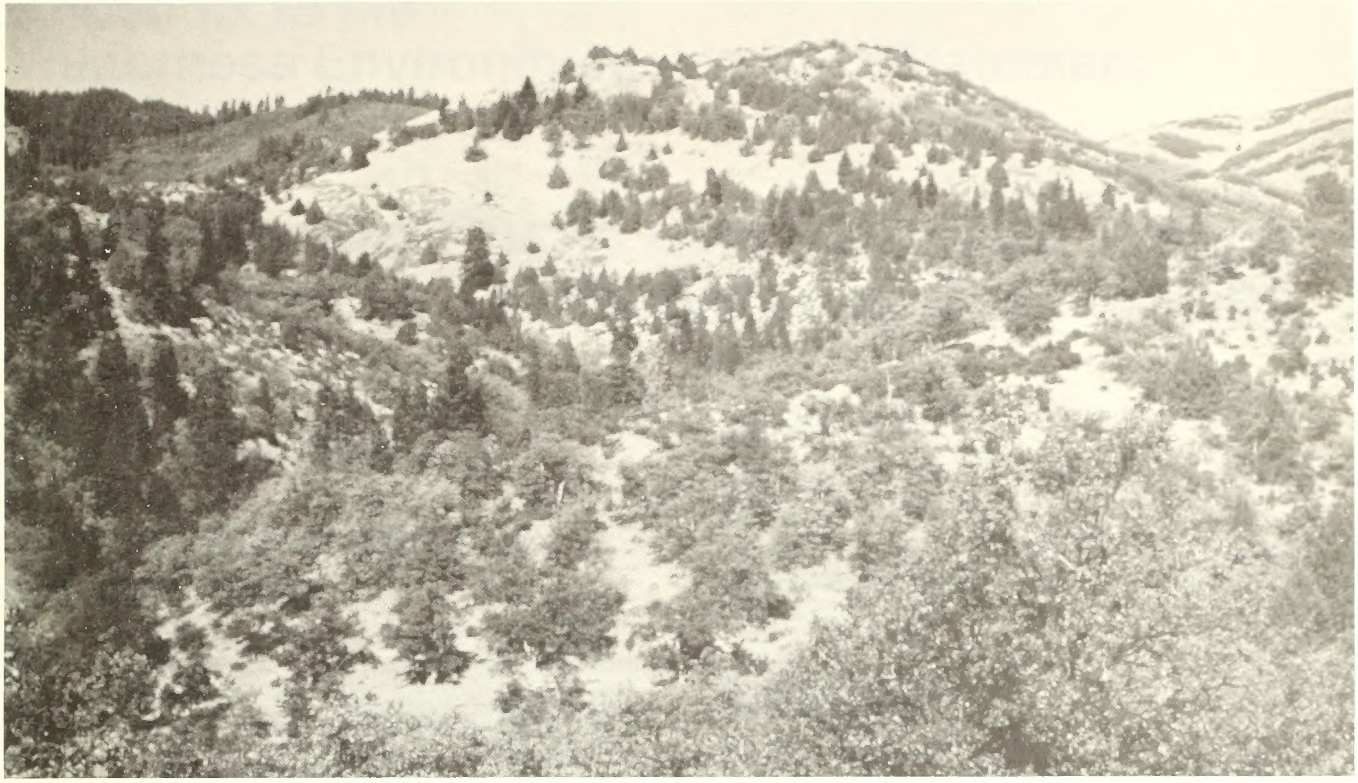
OR-11-17

SPECIAL FEATURES

1 0 1 2 MILES

MAP 5



Soda Mountain WSA, OR-11-17. Looking northeast into WSA from above Schoheim Road. Within area recommended suitable under the proposed action (all wilderness) alternative. Shows typical vegetation of the lower elevations in the WSA. Date unknown.

Soda Mountain WSA. OR-11-17. Looking south from Soda Mountain toward Mount Shasta (WSA is in foreground on lower third of photo). Within area recommended suitable under the proposed action (all wilderness) alternative. Date unknown.

Appendix to the Wilderness Environmental Impact Statement for Oregon

North Sisters Rocks (OR-12-8) and Zwagg Island (OR-12-14) Wilderness Study Areas

1. Introduction

General Description of Study Areas

The North Sisters Rocks and Zwagg Island wilderness study areas (WSAs) are located along the coast in Curry County, Oregon. North Sisters Rocks, three small rocks of about one acre each, are located midway between Port Orford and Gold Beach, while Zwagg Island, an island of five acres, is immediately west of Brookings (see Maps 1 and 2).

North Sisters Rocks are surrounded by Pacific surf at high tide and attached on one side to an exposed sand and rock beach at low tide. One rock rises 134 feet and another 78 feet above sea level; the third is somewhat lower. All three rocks have steep, rocky cliffs on all sides and steeply rolling tops. The thin soil mantle atop each rock supports broadleaf coastal shrubs, mostly wind-sheared salal and twinberry, and patches of grass.

Zwagg Island rises abruptly in near-vertical cliffs to a flat top 102 feet above sea level. During the winter months, when prevailing winds are from the southwest, Zwagg Island is covered with a thin soil mantle which supports coastal shrub vegetation including salal, wax myrtle, twinberry and poison oak. There are also scattered Sitka spruce and grassy rock niches with herbaceous plants.

Interrelationships

Both of the WSAs are fronted by beaches managed by the State of Oregon. Most of the other offshore marine islands and rocks along the Oregon coast are part of the Oregon Islands National Wildlife Refuge or the Three Arch Rocks National Wildlife Refuge. All of the islands in the Three Arch Rocks Refuge and most of the islands in the Oregon Islands Refuge are designated wilderness. The U.S. Fish and Wildlife Service is studying islands and rocks totaling about 95 acres in the Oregon Islands Refuge for possible wilderness designation. BLM manages three wilderness islands in the vicinity of Sunset Bay. Curry County has not identified any conflicts between the proposed action and county plans.

Scoping

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory, study and EIS planning, scoping and public review process. These concern both the effects of wilderness designation on existing and potential land uses or resources in in the WSAs, as well as the effects of existing and potential land uses on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- impact on wilderness values,
- impact on potential use of rocks for jetty,
- impact on marine mammal and bird use of the WSAs.

No other issues specific to these WSAs were raised by BLM or the public.

2. Description of the Alternatives

This section describes the resource management and development actions planned or projected to occur under each alternative. Projections are based on current conditions and trends and represent a best professional estimate of reasonably foreseeable future actions. Unforeseen changes in such factors as economics, demand, and Federal, State and local laws and policies could result in different outcomes than those projected for this analysis. The actions described for each alternative with a suitable recommendation also include predictions, for analysis purposes, as to whether or not a projected action would be allowed under wilderness designation. These predictions are based on the Wilderness Management Policy (September 1981) and professional judgment regarding approximate project locations, general site conditions, and design features commonly applied to the various types of projects expected. No definitive forecast of the outcome of a site-specific analysis required prior to implementation of any project in a wilderness area can be made.

The following alternatives are analyzed:

- all wilderness (Proposed Action)
- no wilderness/no action

Enhanced wilderness or partial alternatives are not analyzed for North Sisters Rocks or Zwagg Island. There are no reasonable means of enhancing the wilderness values of either WSA, and it would not be feasible to make a partial wilderness designation of such small areas. A public comment suggested consideration of an alternative that would transfer jurisdiction of the WSAs to the U.S. Fish and Wildlife Service as components of the National Wildlife Refuge System. This alternative is not analyzed because it is beyond the scope of this EIS, which serves to amend the South Coast-Curry Management Framework Plan, to address options for transfer of jurisdiction unless such transfer is already part of the existing plan. To do otherwise would be to use the wilderness EIS to reopen the entire land use decision process for all lands in the WSAs.

All Wilderness (Proposed Action)

Under the all wilderness alternative, the entire 8 acres of North Sisters Rocks and Zwagg Island would be recommended suitable as wilderness.

Energy and Mineral Development Actions

Wilderness designation would close all 8 acres of the two WSAs to mineral entry. U.S. Bureau of Mines surveys have indicated an absence of any minerals in either WSA, and have also concluded that the rock comprising North Sisters and Zwagg Island is not suitable for use as riprap or jetty construction. Therefore, no development is projected.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations in accordance with District management goals. No wildlife projects are proposed.

Recreation Management Actions

No recreation management actions are proposed. Motorized vehicle use is impossible, and foot traffic is limited due to the difficulty of ascending all the steep sides of the rocks.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSAs non-suitable as wilderness. It represents the situation most likely to occur without wilderness designation.

Energy and Mineral Development Actions

All of the 8 acres of the WSAs would be open to mineral entry. Since the U.S. Bureau of Mines has determined that no minerals exist within the WSAs and that they are not suitable as a source of jetty rock, mineral exploration and development is unlikely.

Wildlife Habitat Management Actions

Habitat would be managed to support existing wildlife populations. No wildlife projects are planned.

Recreation Management Actions

Motorized vehicle use of the WSAs is physically impossible, and foot traffic would continue to occur on a very low level because of the rugged topography these rocks. No recreation management projects are proposed.

Summary

Table 1 summarizes the projected management actions under each alternative. Table 2 summarizes the environmental consequences of each alternative.

3. Affected Environment

This section discusses only those major environmental conditions that describe the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Both WSAs are in essentially natural condition and appear to be primarily affected by the forces of nature. Well-worn but unobtrusive foot paths wend their way from the bases to the top of each rock and island. The beaches surrounding each rock and island are isolated and undeveloped, but quarry scars, powerlines, highways and housing developments on the mainland are visible from the WSAs.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude are outstanding in the North Sisters Rocks and Zwagg Island WSAs. This is particularly true during the frequent occasions of rain, strong winds and fog. During the less frequent clear days and especially during the summer tourist season, the opportunities for solitude are diminished due to the small size of the rocks and island and the easy hike from nearby points of public access.

Primitive recreational opportunities ocean and rugged coastline as well as the annual migrations of many species of marine mammals and birds. Excellent rock fishing is available on the seaward side of each island. The north side of Zwagg Island is a good site for gathering abalone.

Special Features

A plant species of special interest, *Dudleya farinosa,* occurs on the windswept, often harsh environment at the top of each rock and the island. (This plant is discussed further in the Vegetation section.) Several thousand gray whales pass within a few hundred feet of the WSAs during annual migrations. Scenic vistas are outstanding.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Kuchler system of classifying ecosystems, the WSAs are in the Pacific Forest Province and have a potential natural vegetation of spruce-cedar-hemlock forest. The island and rocks do not contain any terrestrial ecosystems listed in the Oregon Natural Heritage Plan, but they are bordered by several of the marine aquatic ecosystems listed in the plan.

Within five hours' driving time of the WSAs, there are four standard metropolitan statistical areas with populations over 100,000: Eugene/Springfield, Portland, Salem, and Medford, Oregon.

Energy and Mineral Resources

The U.S. Bureau of Mines surveys have determined that no mineral values are associated with the WSAs. The extremely small size of the WSAs makes it unlikely that they would be suitable for procurement of geothermal resources. The rock comprising the WSAs is not suitable for use as rip rap and jetty construction. As of October 16, 1987, there are no mining claims or leases in the WSAs.

Vegetation

The dominant vegetation of Zwagg Island is a mixed cover of poison oak/salal, while the North Sisters are capped by a dense mat of grass. A plant of special interest found in the WSAs (mentioned in the Special Features section) is *Dudleya farinosa* (sea cliff stonecrop). This plant species is on List 2 of the Oregon Natural Heritage Plan's "Rare, Threatened and Endangered Plants and Animals of Oregon."

Wildlife

Marine mammal and bird use of the WSAs is minimal. Frequent visitations and disturbance by humans have probably precluded the development of rookeries on the rock and island tops. Ospreys have been observed perching on spruce snags at Zwagg Island.

Recreation Use

Recreational use of the WSAs is sporadic. Some rock fishing occurs throughout the year, but most use occurs during the summer. Reaching the tops of the rocks and island is a challenging experience for most individuals, but the spectacular view attracts some interest.

Local Personal Income

There are no significant economic values or activities directly associated with the rocks and island. The amount of recreational activity is too small to attribute to dollars of local personal income.

4. Environmental Consequences

Introduction

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. The statewide volume discusses certain assumptions that were made for this analysis.

Impacts of the Alternatives

All Wilderness (Proposed Action)

Recommended suitable for wilderness: 8 acres.
Recommended nonsuitable for wilderness: 0 acres.

Impacts on Wilderness Values

The all wilderness alternative would add two coastal rocks (totaling 3 acres) and an island (of 5 acres) to the National Wilderness Preservation System. It would assure the preservation of the wilderness characteristics of naturalness, opportunities for solitude and primitive and unconfined types of recreation, and special features associated with the rocks and island.

Conclusion: Wilderness designation of the three acres of North Sisters Rocks and 5 acres of Zwagg Island would result in protection of their existing wilderness values.

Impacts on Energy and Mineral Development

Wilderness designation would close the eight acres in the two WSAs to energy and mineral entry.

Energy Development

No energy resources have moderate or high potential for occurrence in the WSAs. Therefore, no development is projected.

Conclusion: No impact on energy development is expected.

Mineral Development

The rock comprising the WSAs is rated as unsuitable for jetty or rip rap materials. No other mineral resources have moderate or high potential for occurrence in the WSAs. Therefore, no development of mineral resources is projected.

Conclusion: No impact to mineral development is expected.

No Wilderness/No Action

Recommended suitable for wilderness: 0 acres.
Recommended nonsuitable for wilderness: 8 acres.

Impacts on Wilderness Values

Under the no wilderness/no action alternative, the public lands in the two WSAs would not be designated as wilderness, and wilderness values would not receive legislative protection. However, no energy or mineral development, motorized recreation, or other resource uses are projected to occur in the WSAs. Therefore, the area's wilderness values would not be altered in the foreseeable future.

Conclusion: No impacts to wilderness are expected, since no impairing activities are projected.

Impacts on Energy and Mineral Development

The three acres of North Sisters Rocks and five acres of Zwagg Island would be open to energy and mineral entry.

Energy Development

Since there are no energy resources with moderate or high potential for occurrence in the WSA, no energy development is projected.

Conclusion: There would be no impact on energy development in the WSAs.

Mineral Development

The WSAs are rated unsuitable for jetty rock and rip rap materials, and there are no other mineral resources with moderate or high potential for occurrence in the WSAs. Therefore, no mineral development is projected.

Conclusion: There would be no impact on mineral development in the WSAs.

Unavoidable Adverse Impacts of the Proposed Action

Under the proposed action (All Wilderness), there would be no adverse impacts to wilderness or other resources and resource uses, since there are no existing or projected incompatible resource uses.

Relationship Between Short-Term Uses and the Maintenance and Enhancement of Long-Term Productivity

Under the proposed action, the existing short-term uses would continue. The long-term productivity of the wilderness values would be preserved.

Irreversible and Irretrievable Commitments of Resources

Under the proposed action, there would be no irreversible or irretrievable commitment of the wilderness resource or any other resource.

5. Wilderness Manageability and Rationale for the Proposed Action

Manageability of the Area as Wilderness

Each of the areas would be manageable as wilderness. The location and difficulty of access to each of the WSAs ensures solitude for the visitor. While the carrying capacity of each of the rocks and islands is limited, the number of visitors will undoubtedly always be small. There are no privately owned interests, valid existing rights, valid mining claims, mineral leases, or rights-of-way associated with either of the WSAs.

Rationale for Selection of the Proposed Action

Both North Sisters Rocks and Zwagg Island are relatively free of the signs of human activities and appear to have been affected primarily by the forces of nature. There is considerable opportunity for solitude on these rocks and island, which are surrounded on three sides by ocean and border an undeveloped beach. They afford a good view of the surrounding coastline and are good vantage points from which to view migrating birds and marine mammals. A sensitive plant species and important archeological values would be protected by wilderness designation.

Management of the WSAs as wilderness would be consistent with the U.S. Fish and Wildlife Service's management of other offshore rocks and islands as a wildlife refuge and wilderness.

6. Summary and Analysis of Public Comments

Following is a summary of public comments specific to this WSA, concerning adequacy of the analysis in this appendix, and responses to those comments. These comments were received both in writing and as oral testimony at public hearings during the comment periods for the 1985 Draft EIS and 1987 Supplement to the Draft EIS. Comments concerning BLM's wilderness recommendations or rationale were considered in developing the proposed action in this Final EIS and will be summarized in the Wilderness Study Report for this area. Comments concerning statewide issues and analyses are addressed in the Statewide volume.

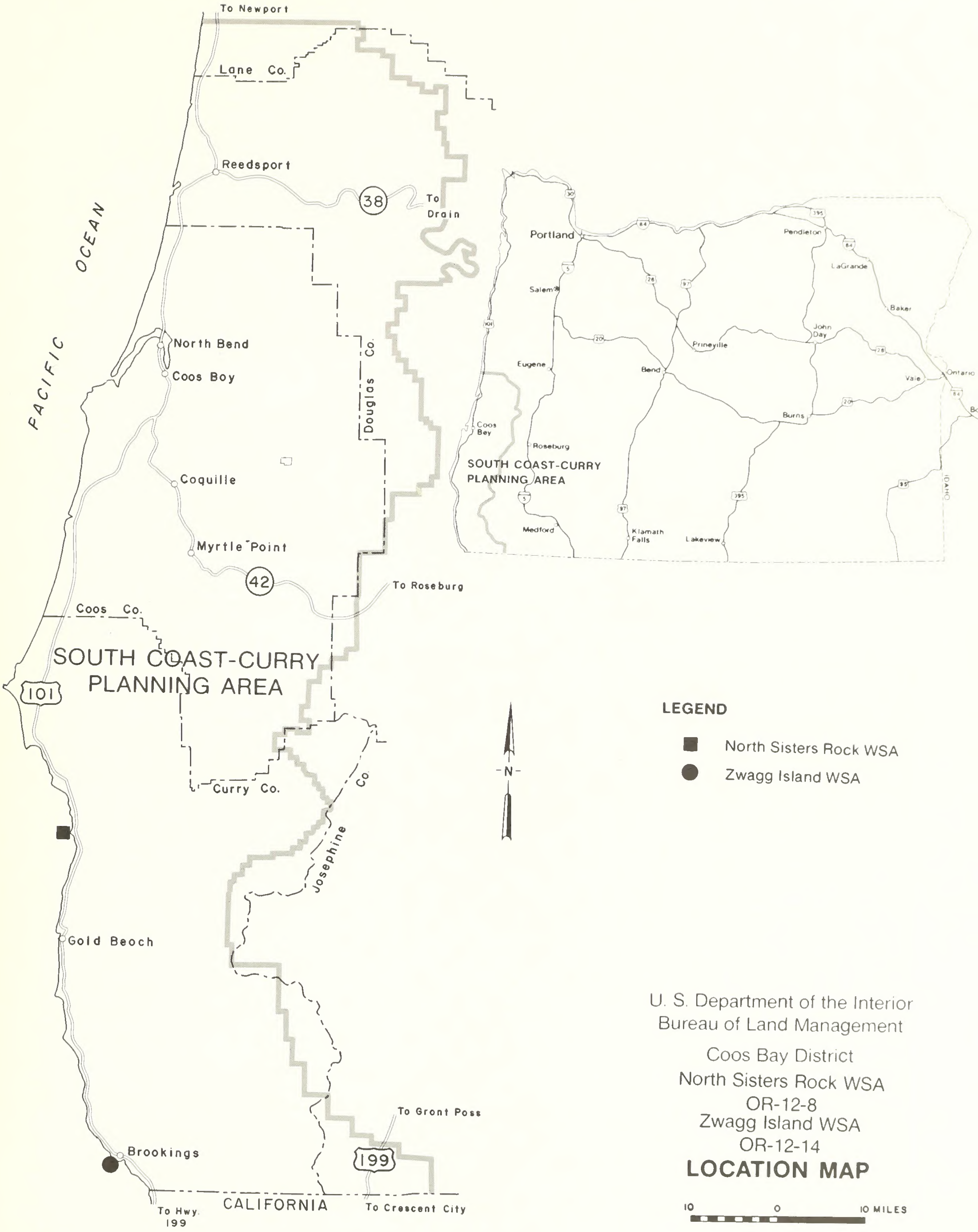
Comment: An alternative that would transfer the WSAs to the U.S. Fish and Wildlife Service as components of the National Wildlife Refuge System should be analyzed. **Response:** See discussion in Section 2, Description of the Alternatives, regarding alternatives considered but not analyzed.

Table 1. Summary of Proposed Management Under Each Alternative, North Sisters Rocks (OR-12-8) and Zwagg Island (OR-12-14) WSAs

Proposed Management	All Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	8	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	8	0

Table 2. Summary of Environmental Consequences of Alternatives, North Sisters/Zwagg Island WSAs (OR-12-8 and OR-12-14)

Resource or Activity	All Wilderness (Proposed Action)	No Wilderness/No Action
Wilderness Values	Wilderness designation of 3 acres of N. Sisters Rocks and 5 acres of Zwagg Island would protect existing wilderness values.	No impacts expected, since no impairing activities projected.
Energy and Mineral Development	No impact to energy or mineral development expected, since none projected.	No impact to energy or mineral development.



LEGEND

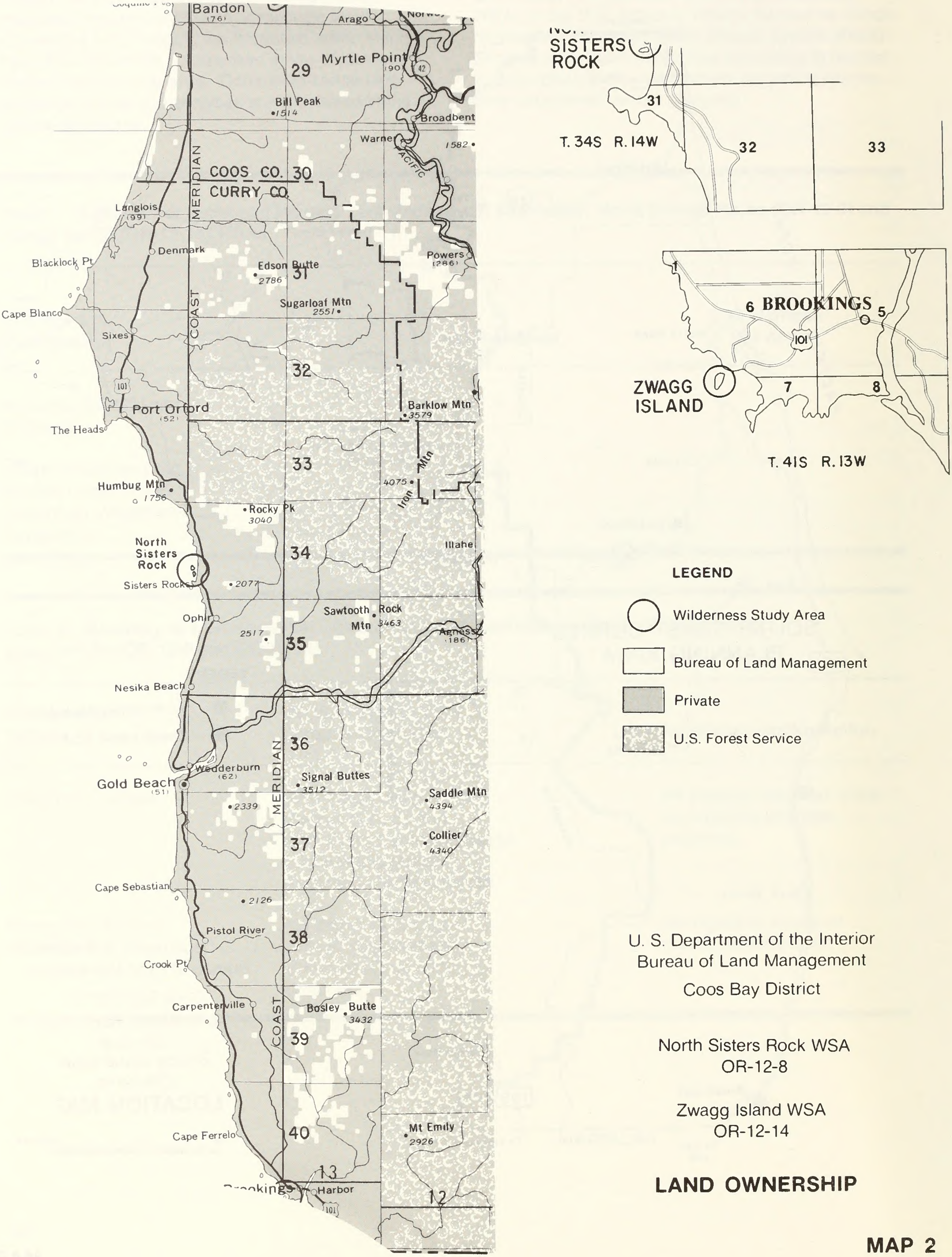
■	North Sisters Rock WSA
●	Zwagg Island WSA

U. S. Department of the Interior
Bureau of Land Management

Coos Bay District
North Sisters Rock WSA
OR-12-8
Zwagg Island WSA
OR-12-14

LOCATION MAP

MAP 1



LEGEND

○ Wilderness Study Area

☐ Bureau of Land Management

▨ Private

▨ U.S. Forest Service

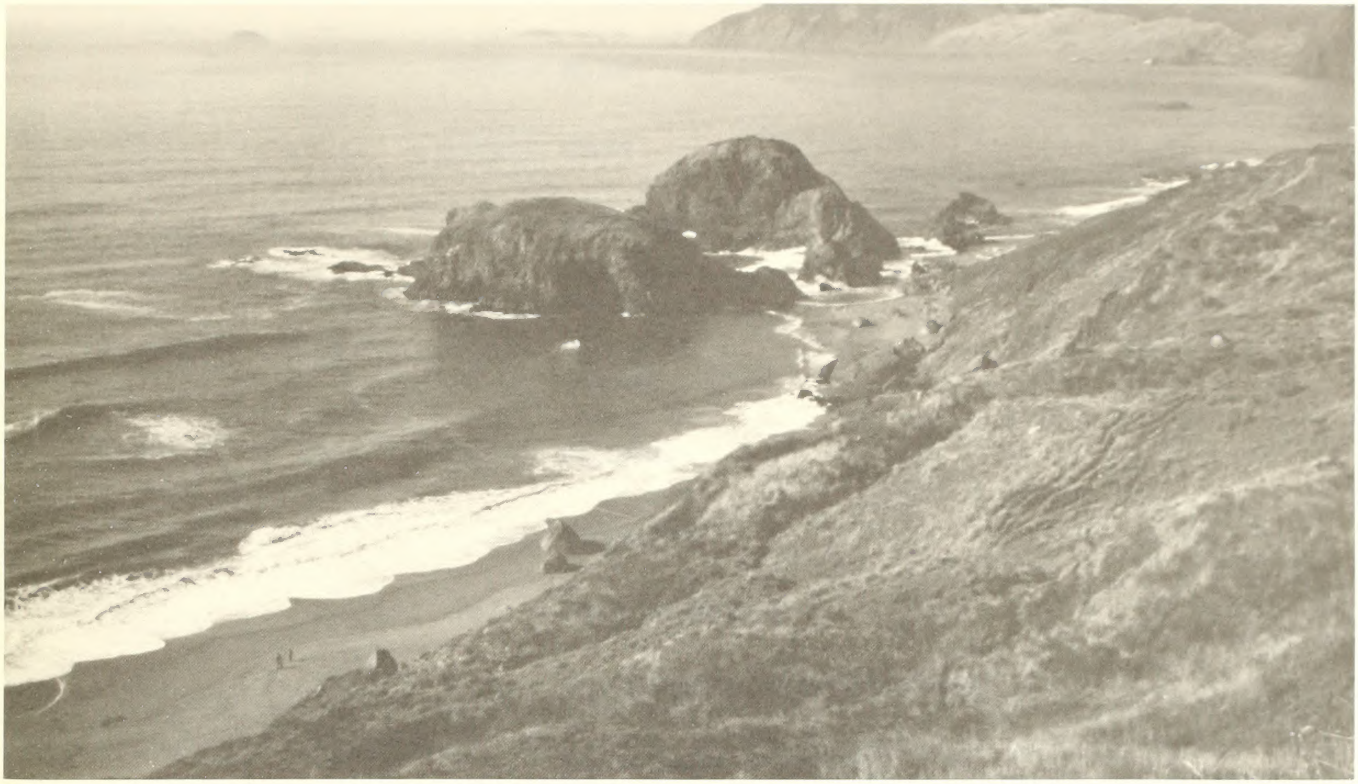
U. S. Department of the Interior
Bureau of Land Management
Coos Bay District

North Sisters Rock WSA
OR-12-8

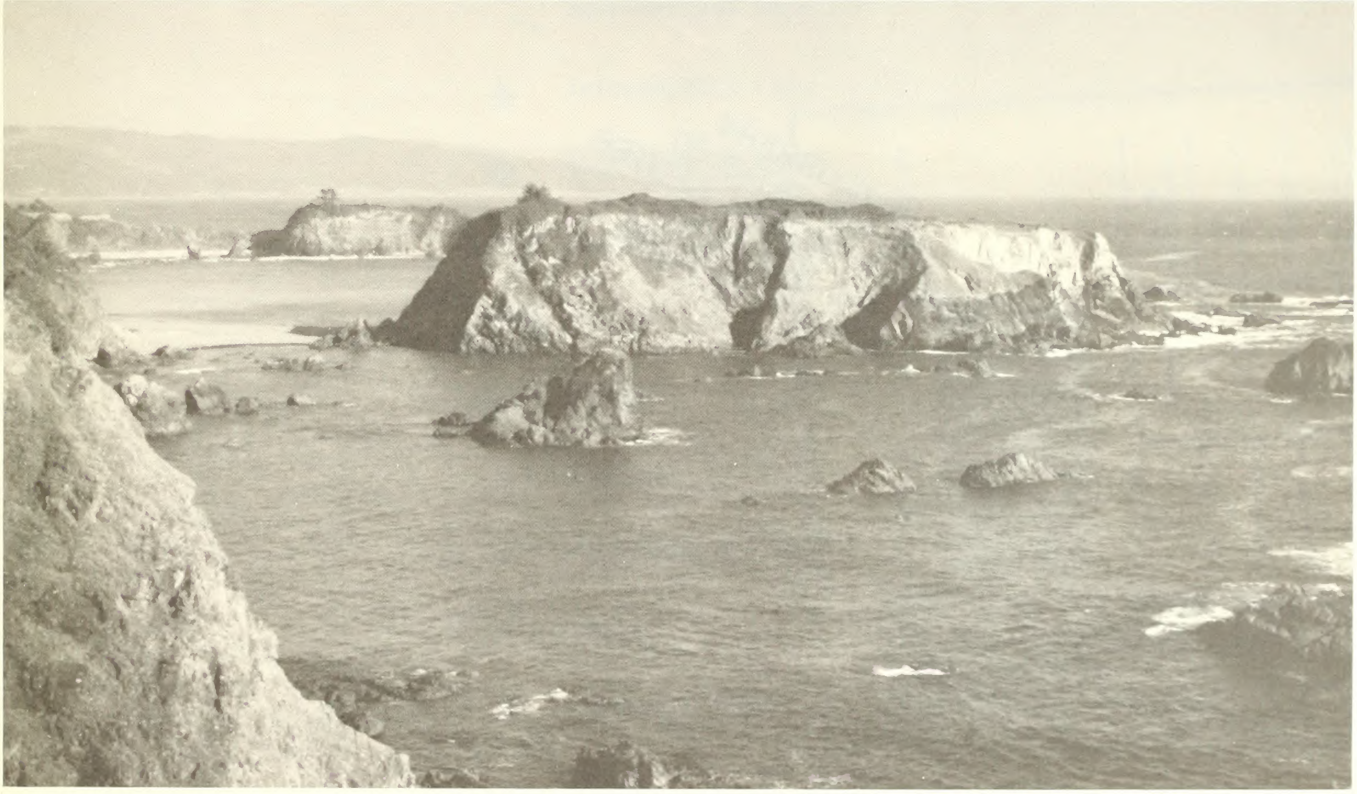
Zwagg Island WSA
OR-12-14

LAND OWNERSHIP

MAP 2



North Sisters Rocks WSA, OR-12-8. Looking northwest from slope on mainland above the WSA (WSA includes tallest rock on the right). Within area recommended suitable under the proposed action (all wilderness). Date unknown.



Zwagg Island WSA, OR12-14. Looking south from shore toward WSA (WSA is island in center of photo). Within area recommended suitable under the proposed action (all wilderness). August 1978.

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Road

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Reservoir or Retention Dam

Earth Tank or Charco

Perennial Stream

Intermittent Stre

Intermittent Lake

Dry Lake or Po

Marsh

Lava

Sand

Spring

Improved Spring

Well

Artesian Well

Peak

Rims

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